2027

MORE ACCURATE,
MORE EFFICIENT!

Testing Instruments
For Paint, Ink and Coating

Product Catalogue 2027

Solvica B.V.
Advanced Testing Equipment
P.O. Box 202 - 8250 AE -
Dronten
The Netherlands
Office +31 (0)88 3310661
info@solvica.com
www.solvica.com

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VISCOSITY

In the coatings world, as well as in many other industries, where liquid or non-solid materials are manufactured, emerging fast growing and demanding markets have led to the development of new innovative product ranges.

As a result, many of these products are manufactured today using materials with complex formulations and processes, resulting in greater quality. Due to this, viscosity, amongst the many other important material properties to be considered becomes more complex to control.

To meet this stringent manufacturing requirement and to continually achieve such high performance products, the use of highly accurate testing techniques is absolutely essential in R & D, Production and Quality Control.

Biuged Instruments supplies an extensive range of complementary viscometers, covering many viscosity and consistency testing methods. Featuring leading edge technology and user friendly operation, they are dedicated to various industrial applications.

Flow Cups

The efflux time, measured in seconds, is often sufficient for a relative classification. It is determined using flow cups of various designed. Flow cups, originally designed to perform quick viscosity and consistency evaluations of Newtonian or near Newtonian products, can provide a high degree of accuracy and repeatability depending on the quality of their manufacture.

Flow cups hold a defined volume of liquid which flows through an orifice. Results are expressed as time in seconds for the liquid to flow through the orifice until the first break in the efflux stream occurs.

The reproducibility of this test method depends on:

- Accuracy of the cup size
- A constant temperature during the measurement
- The Newtonian flow of the liquid

Biuged sells out more than 3,000 flow cups every year. In our manufacturing process and quality control procedures guarantee highly accurate flow cups:

- High precision computerized machines are used for production
- Each single cup is checked with test oils（3 different viscosity ） in our constant temperature and humidity room
- All flow cups come with calibration certificate.

Procedure:

- Adjust the sample to measuring temperature, usually 25°C (77°F).
- Select the cup that will provide readings which are well within the cup range.
- Make sure that the cup is clean and place it into its support.
- Make sure that the cup is level.
- Place a finger under the cup orifice and fill the cup with bubble free test material. The cup is full when the meniscus disappears where the liquid joins the sidewall of the cup. If the cup is overfilled, scrape the access into the cup well with a spatula or by passing the cover plate across the top of the cup. Note that the finger can be removed from the orifice when the cover plate is in place. Start a timer as the cover plate is removed from the cup.
- Determine the temperature of the efflux stream. If there is a significant change during the test it should be repeated.
- Stop the timer at the first break of the efflux stream, one or two inches below the orifice.
- Repeat the measurement three times, each with a new sample of the same material.Calculate the average value.
- Record the cup type and number, measured temperature, and efflux time. For best accuracy, average three or more readings.
- Promptly clean the cup, giving special care to the orifice.



Operating Steps

How to Choose Your Viscosity Cups?

Generally, operators can first select a type of viscosity cup based on the specific requirements of different countries or regions (corresponding to different standards) or different industries/supply chains. Then, they can choose the corresponding cup number based on the viscosity range of the sample. The types of viscosity cups currently offered by BGD and their differences are detailed in the table below:

Viscosity Cups	Ordering Information	Standards	Numbers	Notes
Iwat Cups	BGD 122	---	No.2	Hand-held
Ford Cups	BGD 125	ASTM D1200	No.1，No.2，No.3，No.4，No.5	Hand-held for No.4
Zahn Cups	BGD 126	ASTM D4212	No.1，No.2，No.3，No.4，No.5	Hand-held
DIN Cups	BGD 127	DIN53211	No.2，No.4，No.6，No.8	Hand-held for No.4
ISO Cups	BGD 128	ISO 2431	No.3，No4，No.5，No.6，No.8	---

Note:

1- After prolonged use, the smoothness of the inner wall and the orifice diameter of viscosity cups may change due to repeated cleaning. Therefore, regular calibration of viscosity cups is necessary.

2- Although most standards specify the orifice diameter and tolerance of viscosity cups, during actual production, factors such as cup volume and inner wall smoothness vary. Manufacturers adjust the actual orifice size of each viscosity cup based on the flow time of standard viscosity oils!

3- All viscositys cups could come with optional ISO 17025 calibration.

① Ford Cups

Ford Cups produced by our company are in accordance with International Standard ASTM D1200, D333, D365. For easy measurement of the viscosity of paints, inks, lacquers and other liquids. All Biuged Ford cups are machined anodic oxidation aluminum with removable stainless steel orifice and are guaranteed to be within 2% throughout the recommended range of use.

Main Technical Parameters：	
★ Internal Diameter：	50 ± 0.05mm
★ Outer Diameter：	86 ± 0.1mm
★ Internal Orifice Length：	10 ± 0.1mm
★ Production Tolerance：	±2%
★ Come with calibration certificate	



◆ **Details of each Ford Cups**

Details/Ford cup	Ford Cup （No.2）	Ford Cup （No.3）	Ford Cup （No.4）	Ford Cup （No.5）	Hand-Held Ford Cup （No.4）
Internal Vertical Height （mm）	43 ± 0.1	43 ± 0.1	43 ± 0.1	43 ± 0.1	43 ± 0.1
Internal Orifice ϕ （mm）	2.53	3.40	4.12	5.20	4.12
External Orifice ϕ （mm）	5.0 ± 0.5	5.5 ± 0.5	6.0 ± 0.5	7.6 ± 0.5	6.0 ± 0.5
Measurement Range （cSt）	25–120	49–220	70–370	215–1413	70–370
Suitable Flow Time （sec）	40–100	25–105	20–105	20–105	20–105
Ordering Information	BGD 125/2	BGD 125/3	BGD 125/4	BGD 125/5	BGD 125/4P

② ISO Flow Cups

ISO Flow Cups produced by our company are in accordance with International Standard ISO 2431, DIN 53224, EN 535：ASTM D5125 《Paints and varnishes-Determination of flow time by Use of Flow Cups（Fourth edition）》. They are made of high quality aluminum and feature stainless steel nozzle inserts（specification dependent）. They are mirror polished& smooth finished（Ra≤0.5 m）ffor high efflux accuracy and easy maintenance. ISO Flow Cups are applicable to Determine the flow time of Newtonian and near Newtonian fluids.

Main Technical Parameters：	
★ Material：	Anodized Aluminum
★ Weight：	0.38Kg
★ Come with calibration certificate	



◆ **Details of each ISO Cups**

Details/ISO Cup	ISO No.3	ISO No.4	ISO No.5	ISO No.6	ISO No.8
Orifice ϕ （mm）	3.0	4.0	5.0	6.0	8.0
Suitable Flow Time （sec）	30–100	30–100	30–100	30–100	30–100
Measurement Range （cSt）	7–42	34–135	91–326	188–684	600–2000
Ordering Information	BGD 128/3	BGD 128/4	BGD 128/5	BGD 128/6	BGD 128/8

③ DIN Flow Cups

The Biuged DIN and Dip Viscosity Cups are produced with an easily removable orifice. Cup and orifice production tolerance permits replacement of the orifice without loss of acceptable tolerance. In accordance with Deutsche Normen DIN 53211.

It complies with DIN 53211 standard and is applied for low viscosity liquids.

Main Technical Parameters：
★ Volume of Cup： 100ml ± 1mL
★ Orifice Diameter Tolerance: ± 0.02mm
★ Body is made of anodized aluminum
★ Stainless steel orifice, interior polished
★ Come with calibration certificate
★ **Ordering Information：**
BGD 127/2----DIN 2# Flow Cup (Orifice Dia.:2mm)
BGD 127/4----DIN 4# Flow Cup (Orifice Dia.:4mm)
BGD 127/6----DIN 6# Flow Cup (Orifice Dia.:6mm)
BGD 127/8----DIN 8# Flow Cup (Orifice Dia.:8mm)
BGD 127/4P----Hand-Held DIN 4# Flow Cup (Orifice Dia.:4mm)



④ Zahn Cups

Zahn Cups can be used to quickly measure the viscosity of liquids such as Paint, Ink, Varnishes, Syrup and Oil. They are produced according with ASTM D816, ASTM D1084, ASM D4212.The Stainless Steel Cups are molded precisely and the orifices are precision drilled using high-speed CNC drilling.

Each cup has a 12-inch loop handle to allow the cup to be dipped by hand into a liquid container. At the center of this handle is a finger-ring for holding the cup in a vertical position during use. Their orifice diameters are set at the factory for appropriate results with applicable NIST traceable Newtonian oils.

It is done by filling up the volume of Zahn Cup with the required liquid and then placing an index finger over the orifice to stop any flow out of the liquid. A ring at the Zahn Cup handle allows the cup to be hanged perpendicularly（still with the finger stopping any liquid flow out）. Prepare a Digital stopwatch and set zero. Immediately start the stopwatch when the finger is released. As soon as there is a first "break" of the flow, stop the stopwatch. The second shown is the time of the liquid flow, which is also the flow viscosity of that liquid.

Every Biuged's Zahn cup has its own coefficient "k",which is marked on the cup body.

Fact Viscosity=Testing viscosity × K

Main Technical Parameters：	
★ Volume of Cup：	43mL ~ 49mL
★ Length of Handle：	40 ± 0.1mm
★ Height of Cup：	58 ± 0.1mm
★ Measurement Temperature：	25℃ ± 1℃
★ Come with calibration certificate	



NOTE:

1. Both the Zahn Cups and the Iwata Cup are based on measuring the Flow of liquid in seconds. Hence, a precision stopwatch is required.

2. The orifice diameter of Zahn cup may be a little different from standard requirements due to some uncontrollable factors during manufacturing process. But we ensure the flow time conforms to standards.

Results should be reported in Zahn-Seconds at a specified temperature for a particular cup. To convert Zahn-Seconds to centistokes, refer to ASTM D 4212,D816,D1084

Centistokes ×Specific Gravity= Centipoise

◆ **Details of each Zahn Cups**

Details/Zahn cup	Zahn Cup No.1	Zahn Cup No.2	Zahn Cup No.3	Zahn Cup No.4	Zahn Cup No.5
Flow time Range （sec）	33.5–80	20–80	20–75	20–80	20–80
Measurement Range（cSt）	5–56	21–231	146–848	222–1110	460–1840
Applications	Thin–bodied materials	Clears, lacquers,enamels, press–side adjustment of flexographic inks	Manufacturing of flexographic inks	More viscous paints and inks	Silk screen inks
Ordering Information	BGD 126/1	BGD 126/2	BGD 126/3	BGD 126/4	BGD 126/5

⑤ Japanese Iwata Cups（NK-2 Cups）

The Iwata cup is based on the Japan method of liquid viscosity measurement. It is used to test sample viscosity which is going to spray by spray gun. The procedure of usage is the same as that of the Zahn Cups.

Main Technical Parameters：
★ Volume of Cup： 50ml ± 2mL
★ Orifice Diameter： 3.5mm ± 0.1mm
★ Cup Material： Nickel–plated brass
★ Cup External Diameter： 42.0mm ± 0.2mm
★ Cup Internal Diameter： 35.0mm ± 0.2mm
★ Suitable Test Range： 20s to 100s
★ **Ordering Information:**
BGD 122–––NK–2 Iwata cup



⑥ Stand For Flow Cup

It is important to be levelfor any flow cup as well as its sample during testing of sample viscosity. Biuged offerssomedifferent simple stands as below according to different applications. All stands have a levelling device and can be adjusted to be level through the foot screws or adjustable poles.



BGD 130



BGD 131



BGD 132



BGD 133

Ordering information:

BGD 130–––Square Stand

BGD 131–––Tripod Stand

BGD 132–––Stainless Steel Stand

BGD 133–––Tripod Stand with double–walled thermojacket

⑦ Viscosity Inspection Kits

Biuged offer viscosity inspection kits which can finish viscosity measurement simply. Each kit contains a viscosity flow cup（Ford cup, ISO flow cup or DIN cup）, a cronometro, a stand, a container and a strong carrying case.

Ordering information:

BGD 136–––Viscosity Inspection Kits



Rotational Viscometers

Depending on the method, from traditional scale readings to scientifically defined geometries, rotational viscometers apply a controlled stress to the material under test using defined operating conditions. The resulting data can be then be plotted as a function of the selected criteria.

We provide extended information, as the product under test is submitted to variable stress conditions, depending on the spindle design.

Units are expressed in P (Poise) , or cP (mPa.s) , or converted into other scales. i.e. Krebs units or torque.

Single-speed instruments equipped with rotor, ball, or vane spindle such as the Krebs Viscometers, Rotothinner, or Gel Strength Tester are commonly used world wide by numerous industries to instantly evaluate the flow behavior according to conventional scale.

Multi-speed viscometers equipped with different spindle sizes offer flexible investigations and cover a wider range of applications. They operate with variable dynamic stress and shear rates and can also be configured for absolute measurements, when available, depending on the specific spindle geometry.

Biuged has enough experience for measuring different fluids viscosity. We produce many different types viscometers to meet with different fields and different customers requirements. For some of visocometers, users can choose software to analyise sample's viscosity characteristic.

How to Choose Your Rotational Viscometers ?

◆ **Based on Your Testing Purpose**

For quality control or meeting customer specifications, a basic rotational viscometer (e.g., BGD 162 series) is sufficient.

For evaluating the impact of additives on formulation flow behavior or comprehensively analyzing flow characteristics during storage, application, and film formation, a more advanced viscometer or rheometer (e.g., BGD 168 series) is recommended. These instruments offer a wider speed range (stepless adjustment), multiple rotor options, and additional functions such as variable shear stress, variable shear rate, and programmable control. When paired with dedicated viscosity measurement software, they can generate viscosity vs. time or shear rate curves.

◆ **Based on Your Sample Flow Behavior**

Nearly all raw materials and finished coatings in the paint industry are non-Newtonian fluids, meaning their flow properties vary under different shear rates (determined by rotor geometry and rotational speed). Some materials may also exhibit time-dependent viscosity changes at a given shear rate. To ensure reproducible and repeatable test results, the selected viscometer must provide the exact same shear rate as used in comparative sample testing.

◆ **Based on Special Application Scenarios**

If the sample viscosity is too low (<10 mPa • s), an ultra-low viscosity adapter is required.

If the sample volume is too small (<4 mL), a small sample adapter or cone-plate viscometer should be used.

If viscosity measurement at different temperatures is needed, a viscometer with heating capability must be selected.

◆ **Based on Sample Viscosity Range**

Choose a viscometer with an appropriate measurement range so that the estimated viscosity of the sample falls within 20%-80% of the maximum range. This ensures higher testing accuracy.

All Biuged Viscometers

Products	Application	Standards	Standard Rotors	Speed
BGD 151, BGD 162 Rotary Viscometer	Low shear rates	ISO 1652 ISO 2555 ISO 3219 ASTM D2196 ASTM D2983	4 Rotors	6/12/30/60 or 0.3/0.6/1.5/3/6/12/30/60
BGD 164 & 165 Touch Screen Rotary Viscometer	Low and middle shear rates		4 rotors or 6 rotors	0.1 rpm ~ 100 rpm 0.1 rpm ~ 200 rpm
BGD 168 Rheometer	Low and middle shear rates		4 rotors or 6 rotors	0.1rpm ~ 250rpm (0.1 rpm increments)
BGD 180 Rotothinner	Low and middle shear rates	ISO 2884–2	3 rotors	562 rpm
BGD 182 Cone-and-plate Viscometers	High shear rates	ISO 2884–1	1 rotor	5rpm ~ 1,000rpm (0.1 rpm increments)
BGD 184, BGD 186 Krebs Stormer Viscometer	Low and middle shear rates	ASTM D562 ASTM D1849 ASTM D2243	1 rotor	200 rpm

① Intelligent Touch-screen Rotothinner

BGD 180 Intelligent Touch-screen Rotothinner is a simple, easy-to-use rotary viscometer, it is used to measure sample viscosity character under three different shearing rates ($20S^{-1}$, $44S^{-1}$, $200S^{-1}$), and also can be used to measure viscosity character of same sample depending shearing time.

It complies with ISO 2884-2《Paints and varnishes — Determination of viscosity using rotary viscometers- Part 2:Disc or ball viscometer operated at a specified speed》and BS 3900 A7 standards etc.

Features

◆ Comes with three spindles as below，meets different measuring ranges:

No.1 Disc Spindle: for use with viscosities up to 2.2 Pa·s (2,200 mPa·s), with an average shear rate of approximately $200S^{-1}$ with a Newtonian fluid.

No.2 Big ball Spindle: for use with viscosities up to 7.5 Pa·s (7,500 mPa·s), with an average shear rate of approximately $44S^{-1}$ with a Newtonian fluid.

No.3 Small ball Spindle: for use with viscosities up to 35 Pa·s (35,000 mPa·s), with an average shear rate of approximately $20S^{-1}$ with a Newtonian fluid.

◆ 250 ml Standard container which complies with standard requirements: Inner diameter is 74mm, Height is 74mm

◆ Three reading modes: Manual, Holding max. value and Timing reading

Main Technical Parameters：

★ Range: 0～35Pa·s（0～35,000 mPa·s）
★ Accuracy: ±1.0% of full scale range
★ Repeatability: ±1.0% of full scale range
★ Paddle Speed: 562 r.p.m ± 2%
★ Container Capacity: 250 mL
★ Power Supply: 110V/220V 50/60Hz
★ Overall Dimensions: 270mm×220mm×510mm（L×W×H）
★ Net Weight: 10 kg
★ **Ordering Information:**
BGD180––– Intelligent Touch–screen Rotothinner



Rotors



② Dial Reading Rotary Viscometer

Dial Rotary Viscometer is used in measuring viscosity friction and absolute viscosity of liquid. It has four rotors of NO.1-4 which can be chosen to be in accordance with viscosity of the liquid and the rotation speed. It is widely used to determine viscosity of various liquid such as oil, paint, plastic, food medicine, adhesive, etc. It is widely applied in the field of petroleum chemistry, medicine, food, light industry, textile industry, scientific research, etc.

Main Technical Parameters：

★ Measurement Range: 10–100,000mPa.s（cP）
★ Rotors: Four rotors–––No.1, No.2, No.3, No.4
★ Rotate Speed (r.p.m): 6, 12, 30, 60
★ Measuring Error: ±5%（Newtonian fluids）
★ Electrical Power: 220V/50Hz
★ Weight: 7.9 kg
★ Dimensions: 410mm×350mm×440mm（L×W×H）
★ **Ordering Information:**
BGD 151/1–––Dial Reading Rotary Viscometer



Rotors



③ Intelligent Touch-screen Rotary Viscometer（Basic）

BGD 162 Intelligent Touch-screen Rotary Viscometers are the newest generation to take advantage of the power of the new technology. Compared with other rotary viscometers, BGD 162 are more stable, more precise and more easy to operate.

Features:

◆ Conforms ISO 1652, ISO 2555, ISO 3219, ASTM D2196, ASTM D2983 etc.

◆ 7 inch high definition colorful touch screen which show directly viscosity value, rotor speed, torque etc, easy and convenient to operate.

◆ Magnetic rotors, fast and easy to install or disassemble, also avoid the damage to small shaft.

◆ Built-in high precision electric gradienter and the screen show machine's level status, convenient and fast to adjust the levels.

◆ Strong compatibility, users can calibrate it by themselves.

◆ More samplings per one rotation

◆ With high sub-division stepper motor, the viscometer rotate with accurate speed, low noise and more stable. And the fluctuation of AC power frequency don't influence viscosity measurements.

◆ Showing viscosity value changes continuously and the machine would alarm when it's over measurement range.

◆ Calibrate linearly under the whole range by computer, measurement precision is ±1.0% of full range.

◆ For thixotropic Non-Newton fluid, timing function of viscometer can ensure to get a consistent measurement results.

◆ ARM chip processor, processing data more quickly

◆ Convert freely between various viscosity units, dynamic viscosity convert kinematic viscosity automatically

◆ Can export data by U disc

Ordering Information → Parameters ↓	BGD 162/1	BGD 162/2
Measurement Range (mPa.s)	10～100,000（10^5）	10～2,000,000（10^6）
Rotate Speed (r.p.m)	6, 12, 30, 60	0.3, 0.6, 1.5, 3.0, 6.0, 12, 30, 60
Come with Rotors	LV1, LV2, LV3, LV4（LV0 for optional）	
Measurement Range of LV0 Rotor (Optional)	1～100 mPa.s	1～2,000 mPa.s
Measurement Accuracy	±1.0 % of full range（Newtonian fluids）	
Repeatability	±0.5% of full range（Newtonian fluids）	
Power Supply	Power Supply Adapter: 110V/220V；50Hz/60Hz	
Overall Size/ Net Weight	200mm×240mm×620mm / 7 kg	
Optional Accessories	BGD 162/Z–004–– UL Test Assembly（LV0 rotor + Specified Container, and the measuring range： 1 mPa.s～100 mPa.s→BGD 162/1 ； 1 mPa.s～2000 mPa.s→BGD162/2 ） BGD 845/846––Low–high Temperature Circulating Bath	





Magnetic rotors Convenient disassembly

④ Intelligent Touch-screen Rotary Viscometer（Professional）

BGD 164&BGD 165 Professional Rotary Viscometers are developed by Biuged based on the BGD 162 model. They feature stepless speed adjustment, a wider selection of rotor types, an expanded measurement range, and the following characteristics:

◆ Compliance with Standards: Conforms to ISO 1652, ISO 2555, ISO 3219, ASTM D2196, ASTM D2983, and others.

◆ 7-inch HD Touchscreen: Simple and convenient operation, directly displaying viscosity, rotational speed, torque, the maximum measurable viscosity value for the rotor at the current speed, and other information.

◆ High-resolution Stepper Motor Drive: Enables stepless speed adjustment with accurate and stable rotation, low noise operation, and unaffected measurement accuracy by AC voltage frequency variations.

◆ Built-in High-precision Electronic Spirit Level: Direct on-screen display of the instrument's level status, allowing operators to quickly adjust leveling.

◆ Magnetic Rotor Mounting System: Reduces damage to the spindle during rotor changes, enhancing spindle durability.

◆ New Durable Spindle Design

◆ Switching Power Adapter: Wide input voltage range with strong anti-interference capabilities.

◆ Real-time Sampling Technology: Allows observation of viscosity changes in real-time even at low speeds, eliminating waiting time.

◆ Gelation Time Measurement via Timer Mode: Real-time torque detection enables sensitive measurement even at very low rotational speeds.

◆ Multiple Viscosity Unit Conversion: Automatic conversion between dynamic viscosity and kinematic viscosity.

◆ Factory Calibration & User Recalibration: Linearly calibrated by computer before shipment, with the capability for users to perform independent calibration.

◆ Standard USB Interface: Supports external USB drive for data storage.



Ordering Information → Parameters ↓	BGD 164/L	BGD 164/M	BGD 164/H	BGD 165/L	BGD 165/M	BGD 165/H
Measurement Range (mPa.s)	1–6M	100–40M	800–320M	1–6M	100–40M	800–320M
Rotate Speed (r.p.m)	0.1–100			0.1–200		
Rotors	4	6	6	4	6	6
Measurement Accuracy	±1.0% (of the full range)					
Repeatability	±0.5%(of the full range)					
Power Supply	Power Adapter (Input: 110/220 V; 50 /60 Hz; Output: 12V; 2A)					
Optional Accessories	BGD 162/Z–004–––UL Test Assembly（for BGD 164/L & 165/L, see page 11） BGD 168/Z–010–––UL Test Assembly for Thermostat（for BGD 164/L & 165/L, see page 11） BGD 168/Z–003 (013) –––Precise Thermostat for Viscosity Testing（see page 13） BGD 168/Z–011–––Small Sample Test Assembly for Thermostat （only for BGD 165 matches, Thermostat, see page 12） BGD 168/Z–012–––Small Sample Test Assembly（only for BGD 165, see page 12）					

(M=1milllon)

⑤ Programmable Rheometer

Rotational viscometers are typically used to measure the viscosity (also known as apparent viscosity) of Newtonian or non-Newtonian fluids at specific speeds and with specific spindles. However, in industries such as coatings, inks, adhesives, and other polymer materials, nearly all resins, emulsions, and finished products are non-Newtonian fluids. These materials exhibit different rheological behaviors under varying shear rates (dependent on rotational speed and spindle geometry).

To compare the rheological properties of different materials, a common industry practice is to evaluate their thixotropy or dilution index. This involves measuring the proportional change in viscosity when increasing or decreasing spindle speed to characterize shear-thinning behavior, or comparing viscosity values before and after high-shear conditions to assess thixotropic recovery.

BGD offers several rheometer models tailored to different material rheological properties. Test operators can customize testing programs (e.g., automatic shear rate adjustment) and leverage specialized software to comprehensively analyze material rheology, including simulations of real-world application scenarios.

Features

- ◆ Conforms ISO 1652, ISO 2555, ISO 3219, ASTM D2196, ASTM D2983 etc.
- ◆ 7-inch HD touchscreen: User-friendly interface with clear, detailed display.
- ◆ High-precision stepper motor drive: Stepless speed adjustment, accurate rotation, smooth operation, and noise-free performance. Unaffected by AC voltage fluctuations.
- ◆ Built-in electronic level: Real-time leveling status display for quick and easy adjustment.
- ◆ Magnetic spindle mounting: Reduces shaft wear during spindle changes, enhancing durability.
- ◆ Reinforced shaft design: Engineered for long-term reliability.
- ◆ Switching power adapter: Wide voltage input range with strong anti-interference capability.
- ◆ High-resolution encoder: Real-time sampling; instant readings at any moment, even at low speeds.
- ◆ Programmable testing: Supports timed measurements, programmable speed/temperature ramping (requires optional temperature-controlled small-sample adapter).
- ◆ Real-time sampling technology allows for the observation of viscosity changes even at low speeds without the need for waiting.
- ◆ Multi-unit conversion: Dynamic and kinematic viscosity units interchangeable; automatic calculations.
- ◆ Factory-calibrated & user-recalibratable: Full-range linear calibration via computer; user-adjustable.
- ◆ Optional rheology software: PC-controlled operation and advanced data analysis for comparative rheological studies.



Real–time curve display



RV2、RV3、RV4、RV5、RV6、RV7
（RV1 for optional）rotors



Ordering Information → / Parameters ↓	BGD 168/L	BGD 168/M	BGD 168/H
Measurement Range (mPa.s)	1–6M	50–40M	400–320M
Rotate Speed (r.p.m)	0.1–250		
Rotors	LV1, LV2, LV3, LV4 （LV0 for optional）	RV2, RV3, RV4, RV5, RV6 （RV1 for optional）	
Measurement Accuracy	±1.0% (of the full range)		
Repeatability	±0.5%(of the full range)		
Power Supply	Power Adapter(Input: 110/220 V; 50 /60 Hz; Output: 12V; 2A)		
Optional Accessories	BGD 162/Z–004–––UL Test Assembly（for BGD 168/L, see page11） BGD 168/Z–010–––UL Test Assembly for Thermostat（for BGD 168/L,see page11） BGD 168/Z–003 (013) –––Precise Thermostat for Viscosity Testing（see page 13） BGD 168/Z–004–––Rheometer Control and Data Analysis Software BGD 168/Z–005––– Gel Time Test Kit （10 glass spindles + 1 spindle holder） BGD 168/Z–011–––Small Sample Test Assembly for Thermostat（see page 12） BGD 168/Z–012–––Small Sample Test Assembly（see page 12） BGD 845/846–––Low–high Temperature Circulating Bath		

(M=1milllon)

Ultra-Low Viscosity Test Assembly (ULA)

The smallest rotor supplied with standard rotary viscometers can only measure samples at approximately 15 mPa.s (cP) as the lower limit. For samples with viscosity below 15 cP, accurate measurement is hardly achievable and no torque reading can be obtained.

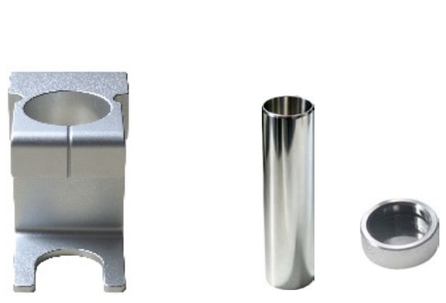
Ultra-Low Viscosity Test Assembly (abbreviated as ULA) offered by Biuged features a minimum measuring range down to 1 cP, with a full measuring range of 1 ~ 2,000 cP (only for BGD 162/1) or 1 ~ 6,000 cP. It is specially designed for testing extremely thin liquids with viscosity similar to water.

This assembly adopts a coaxial cylinder structure, delivering precise shear rate and constant temperature testing capability, with only 16 mL sample volume required.

Ordering Information:

BGD 162/Z–004 ––––– UL Test Assembly (LV0 Rotor + UL Adapter , Suitable for BGD 162, BGD 164/L, BGD 165/L and BGD 168/L viscometers)

BGD 168/Z–010 ––––– UL Test Assembly for Thermostat (LV0 Rotor + UL Adapter + Sample Cup which is compatible with precise thermostat, exclusively for BGD 164/L, BGD 165/L, BGD 168/L models)



UL Adapter



LV0 Rotor

Small Sample Test Assembly (SSA)

Conventional viscosity testing usually requires hundreds of milliliters of sample. However, lab researchers often only have limited sample volume available, especially lab-synthesized small trial batches or high-value specialty materials produced in small quantities.

For such application scenarios, Biuged offers the Small Sample Test Assembly (abbreviated SSA). It only requires approximately 10 mL of sample. Combined with dedicated spindles, the assembly enables complete rheological property analysis of specimens.

Features

◆ Sealed coaxial cylinder design for greatly improved measurement accuracy

Traditional testing adopts disc spindles paired with open sample containers, which deliver unstable boundary conditions and inaccurate shear rate readings. In contrast, the SSA rotor and sample cup form a precision coaxial cylinder with fixed clearance, allowing precise and controllable shear rates. It provides far superior test repeatability for non-Newtonian fluids (resins, adhesives, coatings) compared with standard spindles, ideal for precise rheology measurement in R&D laboratories.

◆ Independent detachable sample cup; no viscometer recalibration required between sample changes.

◆ Standard Accessories: SC4-21, SC4-27, SC4-28, SC4-29 rotor, one of each.

◆ Optional Accessories: SC4-18 rotor, SC4-25 rotor, SC4-31 rotor, SC4-34 rotor

Ordering Information:

BGD 168/Z–011–––Small Sample Test Assembly for Thermostat (for BGD 165& 168)

BGD 168/Z–012–––Small Sample Test Assembly (for BGD 165& 168)



Spindle Holder



SC4–21, SC4–27, SC4–28, SC4–29 rotor



Hook



Sample Cup

Corresponding Measuring Ranges of SC4 Spindles

Rotor	165/L	165/M	165/H	168/L	168/M	168/H
SC4–18	1.5–30K	15–320K	125–2.5M	1.2–30K	12–320K	100–2.5M
SC4–21	2.3–46K	50–500K	200–4M	1.8–46K	20–500K	160–4M
SC4–25	240–4.8M	2.5K–51M	20K–400M	192–4.8M	2K–51M	16K–400M
SC4–27	11.2–234K	125–2.5M	1K–20M	9–234K	100–2.5M	800–20M
SC4–28	22.5–468K	250–5M	2K–40M	18–468K	200–5M	1.6K–40M
SC4–29	46.2–937K	500–10M	4K–80M	37–937K	400–10M	3.2K–80M
SC4–31	15–300K	160–3.2M	1.2K–25.6M	12–300K	128–3.2M	1K–25.6M
SC4–34	30–600K	320–6.4M	2.5K–51.2M	24–600K	256–6.4M	2K–51.2M

Precise Thermostat for Viscosity Measurement (ATC)

Temperature is an extremely critical factor affecting sample viscosity. To accurately and rigorously characterize the rheological behavior of samples, operators must strictly control sample temperature throughout the entire testing process. The precision thermostat for viscosity measurement independently developed by Biuged features the following advantages:

◆ Automatic precision temperature control for samples: Equipped with a built-in precision temperature probe, the unit achieves accurate temperature regulation via multi-point temperature calibration. It delivers fast and precise temperature control across an ultra-wide range of 5℃ to 175℃ or 50℃ to 300℃.

◆ 5-inch high-definition touch screen for user-friendly operation, displaying clearer and more comprehensive data.





Main Technical Parameters:
★ Temperature Control Range: 5℃ ~ 175℃ or 50℃ ~ 300℃
★ Temperature Control Accuracy: ±0.5℃ (5℃ ~ 85℃); ±1℃ (85℃ ~ 175℃); ±2℃ (175℃ ~ 300℃)
★ Temperature Fluctuation: ±0.2℃
★ Compatible Measuring Assembly: Small Sample Assembly, Ultra–Low Viscosity Assembly
★ Power Supply: AC 100V ~ 240V input, 50Hz/60Hz
★ Operating Ambient Temperature: 20℃ ~ 25℃
★ Ordering Information: BGD 168/Z–003–––Precise Thermostat for Viscosity Measurement (5℃ ~ 175℃)
BGD 168/Z–013–––Precise Thermostat for Viscosity Measurement (50℃ ~ 300℃)

Note: When Attached is used with BGD 164 or BGD 165, communication with the main unit (viscometer) is unavailable. That is, the temperature controller cannot be controlled via the main unit program, and the measured temperature will not be displayed on the main unit interface.

⑥ Cone-and-plate Viscometers

Paints or inks often are in different shear rates status from manufacturing to application. As a typical Non-newtonian fluid, paints or inks always show different viscosity characteristics at different shear rates.

Generally speaking, paints are in a low shear rate state when it is stored, transported, levelling and sagging. But they are in the medium shear rate when being pumped, dipped and mixed at a low speed. And at high-speed dispersion, roll, spray and brush coating, they are in a high shear state, and the shear rate is generally $9000S^{-1}$ to $12000S^{-1}$.Therefore, understanding the rheological characteristics of paints or inks at such high shear rates requires the use of cone-plate viscometer to measure.

BGD 182 Cone-and-plate Viscometer uses a special angle conical spindle, which generates a very high shear rate on the measured sample under the high-speed drive of a stepper motor. It conforms to ISO 2884-1 *Paints and varnishes — Determination of viscosity using rotary viscometers — Part 1: Cone-and-plate viscometer operated at a high rate of shear.*

Features:

◆ 7-inch touch screen, menu operation, rich display content (measurement values, spindle No., speed, shear rate, etc.), simple and convenient to operate.

◆ Beautiful and durable metal shell, Use a handle to lift up and down, precise and fast positioning, high reliability.

◆ The electrical part of the whole machine has been carefully designed, with high reliability, precision, stability, and ease of use.

◆ ARM chip processor, with faster data processing speed.

◆ High precision linear calibration before leaving the factory, capable of interpolating multiple points to ensure higher measurement accuracy.

◆ Measure the sample viscosity by stepless speed, convenient for operators to choose different shear rates based on the actual application conditions of the sample.

◆ The measured viscosity values vary continuously, and many viscosity units can be freely interchanged.

◆ The instrument automatically alarms when the measurement exceeds the range.

◆ High speed data transmission interface ensures a fast and stable communication connection between the instrument and the computer.

◆ Data storage and exporting data by an external USB function.

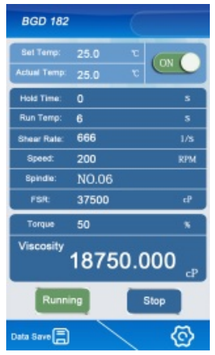
◆ Built in high-precision PT100 temperature sensor, with high temperature control accuracy and good stability.

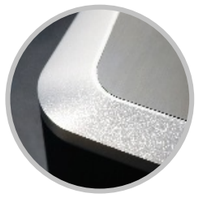
◆ With calibration function to temperature, ensures precise and reliable temperature for controlling.

◆ Powerful and simple calibration function: Users only need one bottle of standard oil and can quickly calibrate the instrument through its built-in calibration menu.

◆ Can choose the data collection and programmed analysis software to analyze the rheological features of the sample thoroughly.







Metal casing, beautiful and durable



Data interface



Fast data processing

Main Technical Parameters：
★ Adjustable Speed Range: 5rpm ~ 1000rpm（ continuously viable, @1rpm ）
★ Measurement error: < 2% of full scale
★ Sample Volume: < 2mL（ See the table below for details ）
★ Two built–in temperature control for option: 5℃–75℃（ L type / Low temperature ）; 50℃–235℃（ H type / High temperature ）
★ Temperature resolution: 0.1℃
★ Temperature control accuracy: ± 0.5℃（ L type ）; ± 1℃（ H type and the set temperature is less than 150℃ ）or ± 2℃（ H type and the set temperature is higher than 150℃ ）
★ Rotors: 10 types for option（ corresponding shear rates and measurement ranges are shown in the table below ）
★ Power Supply: AC 220V, 50Hz/60Hz, the max. current is about 1.5A
★ Size: 275mm × 210mm × 460mm（ L × W × H ）
★ Net weight: 12 kg
★ **Ordering information:**
BGD 182/1L–––Cone–and–plate Viscometer（ Low temperature and Low Torque ）
BGD 182/1H–––Cone–and–plate Viscometer（ High temperature and Low Torque ）
BGD 182/2L–––Cone–and–plate Viscometer（ Low temperature and High Torque ）
BGD 182/2H–––Cone–and–plate Viscometer（ High temperature and High Torque ）
BGD 182/Z–004–––Data Acquisition and Programmable Analysis Software
CAP–01 ~ CAP–10–––Spindle for Cone–and–plate Viscometer





Spindle type	CAP–01	CAP–02	CAP–03	CAP–04	CAP–05	CAP–06	CAP–07	CAP–08	CAP–09	CAP–10
Sample size	67 μL	38 μL	24 μL	134 μL	67 μL	30 μL	1,700 μL	400 μL	100 μL	170 μL
Shear rate range (S^{-1})	66.5~ 13,300	66.5~ 13,300	66.5~ 13,300	16.5~ 3,300	16.5~ 3,300	16.5~ 3,300	10~ 2,000	10~ 2,000	10~ 2,000	25~ 5,000
BGD 182/1 Measurement range (mPa.s)	20~ 1,600	20~ 3,200	20~ 6,600	20~ 13,000	20~ 26,000	20~ 66,000	20~ 2,600	20~ 10,800	20~ 44,000	20~ 4,400
BGD 182/2 Measurement range (mPa.s)	20~ 37,500	40~ 75,000	80~ 150,000	100~ 300,000	300~ 600,000	800~ 1,500,000	78~ 62,500	313~ 250,000	125~ 1,000,000	100~ 100,000

Note: Calculating the shear rate: 13.33 × the current speed（For CAP-01 to CAP-03）;
3.33 × the current speed （For CAP-04 to CAP-06）;
2 ×the current speed （For CAP-07 to CAP-09）;
5 × the current speed （For CAP-10）

⑦ Krebs Stormer Viscometer

BGD 184 Stormer Viscometer is used for measuring the viscosity of Newtonian and non-newtonian fluids in accordance with ASTM D562. The viscosity of a non-newtonian material varies depending on the rate of shear, but Krebs Stormer Viscometer can measure the viscosity at a set speed shear rate which provides a consistent standard.

Based on the popular traditional KREBS method, using a weight-driven rotating paddle to sense the paint viscosity at a constant 200 rpm, this modern digital instrument provides automated motor operation, without weights & pulley, allowing accurate direct reading in KU （Krebs units）or g （gram）. The conversion between these units is automatically calculated by the microprocessor and displayed on request. Sturdy construction allows for use either in a production environment or in the laboratory.

Features:

- ◆ LED digital display gives the reading in Krebs units or grams.
- ◆ Magnetic rotor enables rapid installing, dismantlement or cleaning
- ◆ Self protection function under over-range.
- ◆ Come with Calibration Certificate



Magnetic rotor

Main Technical Parameters:
★ Range: 40.2KU ~ 141.0KU (27–5250 cP)
★ Accuracy: ±1.0% of full scale range
★ Repeatability: ±0.5% of full scale range
★ Paddle speed: 200r/min ± 0.1r/min
★ Overall dimensions: 210mm × 180mm × 500mm (L × W × H)
★ Package Size: 560mm × 450mm × 280mm
★ Package Weight: 9.2 kg
★ **Ordering Information:**
BGD 184–––Krebs Stormer Viscometer
BGD 186/J–042––––Special Paddle for Paste

⑧ Intelligent Krebs Stormer Viscometer

BGD 186 is the newest Krebs Viscometer which is upgraded from BGD 184. It is used widely for making viscosity measurements on paints/coatings in accordance with ASTM D562. Digital version with constant speed motor rotating at 200 r. p. m can get greater accuracy and repeatability for test results.

Comparing with BGD 184, it has these features as blows:

- ◆ Can show "KU", "cP" , "g", "℃" value simultaneously.
- ◆ Designed with calibration fuction: With standard oil, the end user can complete calibration independently, no need return it manufacture
- ◆ Built in infrared thermometer sersor to measure sample temperature, more convenient and more precise.
- ◆ Has a big LCD which can show test result clearly
- ◆ Can set test time and show real time
- ◆ With RS 232 communcation port, can print test results
- ◆ Self protection function under over-range
- ◆ Magnetic rotor enables rapid installing, dismantlement or cleaning
- ◆ Come with Calibration Certificate

Main Technical Parameters:
★ Range: 40.2KU ~ 141.0KU 27–5250 cP
★ Accuracy: ±1.0% of full scale range
★ Repeatability: ±0.5% of full scale range
★ Paddle speed: 200r/min ± 0.1r/min
★ Overall dimensions: 210mm × 180mm × 500mm (L × W × H)
★ Package Size: 560mm × 450mm × 280mm
★ Package Weight: 9.2 kg
★ **Ordering Information:**
BGD 186–––Intelligent Krebs Stormer Viscometer
BGD 186/J–042–––Special Paddle for Paste



Special Paddle for Paste

⑨ Bubble Viscometer Tubes (U-Z6)

Bubble Viscometer Tubes are applicable for viscosity determination of transparent liquids such as paints, resin solutions and varnishes. Each set consists of identical glass tubes pre-sealed with colorless transparent mineral oils of distinct viscosities. The calibrated tubes carry pre-measured data of bubble rise time (seconds) and kinematic viscosity (cm^2/s), arranged in ascending viscosity order as standard reference fluids.

These tubes delivers precise viscosity readings within a short period, making it widely used for in-process intermediate quality control in coating manufacturing.

- • The sealed reference fluids maintain permanent stable viscosity.
- • Sample test tubes can be cleaned rapidly and conveniently.
- • Tubes feature no outlet spouts, eliminating clogging and erroneous measurements.
- • Readings with excellent repeatability can be easily obtained under controlled temperature conditions.

The direct timing method employs glass tubes marked with three horizontal "timing lines" to measure "bubble seconds"—the time required for a single air bubble to vertically travel a fixed distance inside a tube of known inner diameter. Bubble seconds can be converted to Stokes values.

The bubble rise time is directly proportional to fluid viscosity: the faster the bubble ascends, the lower the liquid viscosity.

The BGD 105 Bubble Viscometer Tubes series is divided into four groups, coded alphabetically from A5 to Z10 on the glass tubes, covering a viscosity range of 0.005 to 1000 Stokes:

1. **BGD 105/1 Bubble Viscometer Tubes:** Set A5-A1, 5 bubble tubes total. Suitable for solvents, thinners, low-viscosity additives and monomers.
2. **BGD 105/2 Bubble Viscometer Tubes:** Set A8-T, 20 bubble tubes total. Suitable for conventional resins, vegetable oils, finished varnishes and gloss oils.
3. **BGD 105/3 Bubble Viscometer Tubes:** Set U-Z6, 12 bubble tubes total. Suitable for high-solid resins, base UV resins, adhesive intermediates and heavy-bodied oils.
4. **BGD 105/4 Bubble Viscometer Tubes:** Set Z7-Z10, 4 bubble tubes total. Suitable for molten polymers, ultra-high viscosity solvent-free resins and hot-melt transparent adhesives.

Ordering Information

- ★ BGD 105/1–– Bubble Viscometer Tubes (A5–A1)
- ★ BGD 105/2–– Bubble Viscometer Tubes (A–T)
- ★ BGD 105/3–– Bubble Viscometer Tubes (U–Z6)
- ★ BGD 105/4–– Bubble Viscometer Tubes (Z7–Z10)
- ★ BGD 105/W–001–– Grade A Gardner Empty Glass Tubes (Original Import, 144 tubes per carton)
- ★ BGD 105/W–014–– Bubble Viscometer Tube Holder





Operating Procedure

1. Based on the sample's approximate viscosity, select four standard tubes with viscosity values closest to the specimen.
2. Fill an empty glass tube with the test sample, fit a cork stopper, then mount the four letter-coded standard tubes and the sample tube onto the tube holder.
3. Flip the entire tube holder upside down, and visually match which lettered standard tube shows a bubble rise time closest to that of the sample tube.
4. Use a stopwatch to record the exact bubble rise time (in seconds) for both standard reference tubes and the sample tube.

Standard Oil

BIUGED supply a series of different viscosity standard oil which can bring convinence for calibrating your viscometers or flow cups. They are Newton liquid, with a perfect stability, hydrophobic and damp-proof.Good physical inertia and low surface tension. They can be kept and use for a long time, moreover, it is very cheap.

Every bottle standard oil has been calibrated by **SOUTH CHINA NATIONAL CENTER OF METROLOGY** , and comes with a calibration certificate report which calibrates dynamic viscosity（cP value）and kinematic viscosity （cSt value）, and has a very high reliability and accuracy.

Ordering Information	Dynamic Viscosity （cP）	Kinematic Viscosity （mm^2/s）	Suitable for
BGD 1600/Z-001	5	5.4	ISO Flow Cup No.3
BGD 1600/Z-016	10	10.3	LV0 Rotor for Rotary Viscometer
BGD 1600/Z-002	50	52.1	Zahn Cup No.1； Ford Cup No.2
BGD 1600/Z-003	100	104.2	Zahn Cup No.2； ISO Flow Cup No.4 Ford Cup No.3； Iwata Cup No.2（NK–2）
BGD 1600/Z-004	200	208.3	ISO Flow Cup No.5； DIN Flow Cup No.4； Ford Cup No.4
BGD 1600/Z-005	500（67.2 KU）	520.8	Zahn Cup No.3 and No.4； ISO Flow Cup No.6
BGD 1600/Z-006	1,000（86.3 KU）	1,052.3	Zahn Cup No.5； Krebs Stormer Viscometer
BGD 1600/Z-007	5,000	5,170.6	Rotary Viscometer
BGD 1600/Z-008	10,000	10,416.7	Rotary Viscometer
BGD 1600/Z-017	20,000	20,512.8	Rotary Viscometer
BGD 1600/Z-009	30,000	31,039.8	Rotary Viscometer
BGD 1600/Z-018	50,000	51,282.1	Rotary Viscometer
BGD 1600/Z-010	60,000	62,176.2	Rotary Viscometer
BGD 1600/Z-011	100，000	103,092.8	Rotary Viscometer whose range is over 100,000 cp
BGD 1600/Z-012	67.2 KU	----	Krebs Stormer Viscometer
BGD 1600/Z-013	86.3 KU	----	Krebs Stormer Viscometer
BGD 1600/Z-014	106.6 KU	----	Krebs Stormer Viscometer
BGD 1600/Z-015	121.5 KU	----	Krebs Stormer Viscometer



Notice:

① The tested value of below table is tested at 25℃.

② For every bottle standard oil, the fact viscosity value should be taken as final by calibration certificate report.

③ The period of validity for viscosity value of standard oil is one year, it should be recalibrated every year.

Original Coating Performance

Fineness of Grind Gauges

Many types of solid materials must be ground or milled into finer particles for dispersion in appropriate liquid vehicles. The physical properties of the resulting dispersions, often called “grinds”, depend not only on the actual size of the individual particles ,but also on the degree to which they are dispersed.

The Fineness Gauges are used to indicate the fineness of grind or the presence of coarse particles or agglomerates in a dispersion. It does not determine particle size or particle size distribution.

Grind gauges are used in controlling the production, storage, and application of dispersion products produced by milling in the paint, plastic, pigment, printing ink , paper, ceramic, pharmaceutical, food and many other industries.

The Fineness Gauges is a flat steel block in the surface of which are one or two flat-bottomed grooves varying uniformly in depth from a maximum at one end of the block to zero near the other end. Groove depth is graduated on the block according to one or more scales used for measuring particle size.

The degree of dispersion is indicated in Microns （μm） or Hegman（H）. The Hegman scale ranges from 0 to 8 with numbers increasing as the particle size decreases.

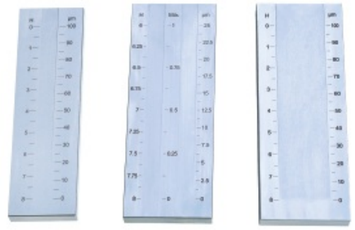
0 Hegman =100 microns particle size
4 Hegman =50 microns particle size
8 Hegman =0 microns particle size

The gauge and its scraper are made of hardened stainless steel and have one or two grooves with a graded slope （dependent on the model chosen）, graduated in microns, mils, NS （Hegman）, Biuged controls precisely every guage and ensure it has a tolerance of ±2 μm（both of upper plan and nether plan flatness is less than 3 μm ）.

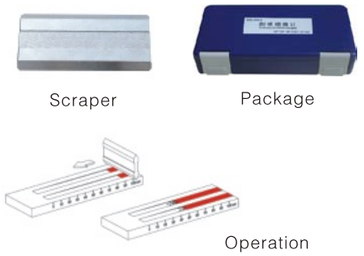
It confirms the below standards: ***ISO 1524, ASTM D1210, ASTM D1316, DIN EN 21524. And all gauges come with Claibration Certificate.***

Procedure

Place a slight excess of sample in the deep end of the groove, and with the straight-edge scraper provided, draw the sample toward the shallow end of the groove. Ratings are in term of the point on the scale where the oversize particles, or furrows made by them, first appear in substantial concentration.



BGD 241　BGD 242　BGD 244



Scraper　Package　Operation

Description	Order Information	Groove Size（L×W, mm）	Ranges（μm）	Overall dimension（mm）	Graduation（μm）	Number of Grooves	Unit
Single-Channel Grind Gauge	BGD 241/0	140×12.5	0–15	170×50×13	0.75	1	μm/ Hegman
	BGD 241/1	140×12.5	0–25	170×50×13	1.25	1	
	BGD 241/2	140×12.5	0–50	170×50×13	2.5	1	
	BGD 241/3	140×12.5	0–100	170×50×13	5	1	
	BGD 241/4	140×12.5	0–150	170×50×13	5	1	μm/μm
Double-Channel Grind Gauge	BGD 242/0	140×12.5	0–15	175×65×13	0.75	2	μm/ Hegman/ Mils
	BGD 242/1	140×12.5	0–25	175×65×13	1.25	2	
	BGD 242/2	140×12.5	0–50	175×65×13	2.5	2	
	BGD 242/3	140×12.5	0–100	175×65×13	5	2	
Wide-Channel Grind Gauge	BGD 244/1	140×37	0–25	175×65×13	1.25	1	μm/ Hegman
	BGD 244/2	140×37	0–50	175×65×13	2.5	1	
	BGD 244/3	140×37	0–100	175×65×13	5	1	

Intelligent Fineness of Grind Tester

Measuring the fineness of paints by grind gauge is a traditional and popular method, but it's very difficult to get a good testing results with high repeatability and comparability. The first reason is the different power and speed are given to scraper by different operators when they use scraper to applicate the sample in the gauge's channel. The second reason is there are always some subjective factors to judge particle number and distribution, because it is not easy to give a test result in 5 seconds, especially for the gauges with small range such as 0-25μm.

BGD 245 Intelligent Fineness of Grind Tester is an intelligent instrument newly developed by Biuged. This instrument can not only automatically draw the sample with consistent speed and power, but also immediately take and save the pictures of the sample particles in the grooves . And according to the regulations of the result reading of the relevant standards, it can automatically identify the fineness value of the sample within 5 seconds, and also display the statistical chart of particle distribution.

Features:

◆ Full-automatic and rapid fineness measurement with excellent convenience, high efficiency and good repeatability & reproducibility.

◆ Directly show the test results according to ISO 1524.

◆ Compatible with different types of grinding gauges, including single-channel (170mm × 50mm), double-channel (175mm × 65mm), wide-channel (175mm × 65mm) with different measuring ranges of 0-25μm, 0-50μm, 0-100μm, 0-150μm and 0-200μm.

◆ Based on the deep learing model framework, it can clearly specifies particles features, and identify pits, scratches, tiny bubbles, and bubble aggregation which could be taken as normal particles, also display the number and size of these defects.

◆ The displayer shows the current sample name, sample batch, testing time, the current steps being executed during the operation, the original image after scraping, the image processed by the algorithm, particle distribution, and the final judgment results according to Method A and Method B.

◆ To ensure consistency between human eye and the recognition system, operator can arbitrarily set the threshold range for the system to recognize particle size. If a detected particle is smaller than the set minimum threshold, it will not be counted in the statistics.If a particle exceeds the maximum threshold and meets bubble characteristics, the system will classify it as a bubble.The operator also can manually choose whether to include bubbles as normal particles in the readings.

◆ In order to compare carefully the fact particles with those which are included or excluded by software ,operator can enlarge the original picture or some parts of particles distribution.

◆ Operator can set the reading time after drawing sample, ensure to achieve a consistent results for every test.

◆ For the convenience of operators to judge the results according to ISO 1524, the system provides a band with a height of 3mm. The operator can drag this band up and down, and the number of particles framed inside would be displayed real-time.

◆ The operation interface displays image processing parameters (particle threshold setting), speed setting, fine plate groove ROI detection area, counting the number of particles, and providing a special option for users to select and delete some misjudged particles

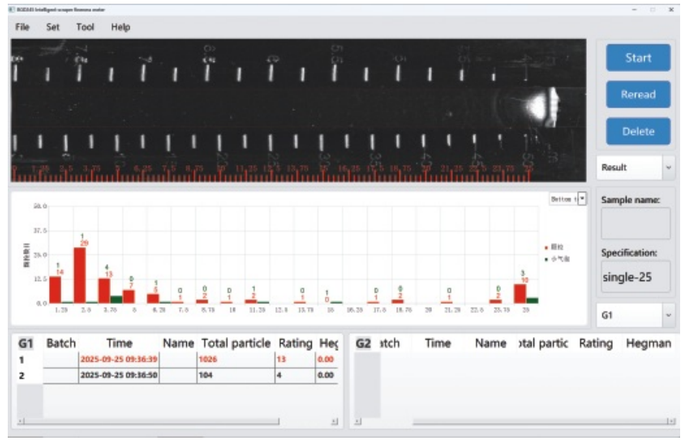
◆ High precision motion control system, with high priecision imaging system, ensure a perfect image resolution and reliable results.

◆ Download the testing results as PDF document

◆ Compatible with water-based sample and solvent-based sample.

Main Technical Parameters：
★ Measuring Range: 0~200 μ m （corresponding to the gauges range used）
★ Suitable Thickness of Fineness of Grind Gauges： 13.1mm~13.4mm
★ Scraping Speed： 30mm/s~90mm/s（adjustable）
★ Measuring Accuracy： one graduation of used gauge
★ Single Testing Time: ＜ 1 min（fastest time is 10s）
★ Overall Size： 640mm × 360mm × 415mm（L × W × H）
★ Total Power： 0.5 kW
★ Net Weight： 30 kg
★ **Ordering Information:**
BGD 245---Intelligent Fineness of Grind Tester





Operation Menu



High-definition Sample Particles Image

Laser Particle Size Analyzer

The laser particle size analyzer utilizes the scattering phenomenon of particles to light, deducing the particle size distribution of the measured particles based on the distribution of scattered light energy. By integrating and optimizing optical, mechanical, electronic, and computer systems, this instrument achieves rapid and accurate measurement of particle size distribution in solid powders or emulsions. It can output the particle size distribution table, distribution curve, average particle size, median diameter, specific surface area, etc., through supporting software. It features intuitiveness, good repeatability, a wide dynamic range, and simple and convenient operation.

Characteristics:

◆ Automatic testing technology: One-button operation, simple and convenient.

◆ High-performancelaser: Stable output, good monochromaticity, high efficiency, significantly improving measurement accuracy.

◆ High-performance stable detectors: Up to 80 (BGD 250) or 92 (BGD 251).

◆ High-performance software: Accurate testing for samples with single, double, or multiple peaks.

◆ Comprehensive sample preparation system: Includes automatic circulation, ultrasonic dispersion, stirring, automatic water intake, automatic cleaning, and dry burn prevention, suitable for all samples, ensuring full dispersion and accuracy and repeatability of test results.

◆ Automatic centering system: Keeps the instrument in optimal condition.

◆ Fast sampling speed: Large amounts of data effectively reduce the impact of a few abnormal data on repeatability.

◆ Random function recognition technology and high-speed pre-amplification technology: Maintains stable instrument signals.

◆ Strict calibration with standard samples before leaving the factory: Ensures accurate and reliable test results.

◆ Unique negative pressure detection technology: Prevents lens contamination.

Additional Features and Functions of BGD 251 All-in-One Laser Particle Size Analyzer:

◆ Positive and negative Fourier patented optical path technology + inclined sample cell technology: Enhances measurement range and improves the accuracy and resolution of fine particle measurement.

◆ Advanced dry sample dispersion system: Sample feeding, air intake, pressure testing, concentration testing, and sample collection are all controlled by a computer, ensuring test stability.

◆ Refractive index measurement function.

◆ PQ verification and data diagnostic functions.

◆ Intelligent dual water level system: Multiple safeguards ensure reliable operation of the instrument.



BGD 250



Solvent-based Circulation
Dispersion Sampling System



BGD 251

Ordering Information → Technical Parameters ↓	BGD 250 Laser Particle Size Analyzer	BGD 251 All–in–One Laser Particle Size Analyzer
Measuring Range	0.1–1000μm	0.02–2600μm (Wet)　0.1–2600μm (Dry)
Repeatability	≤1%（standard sample D50）	≤0.5%（standard sample D50）
Accuracy	≤1%（standard sample D50）	≤0.5%（standard sample D50）
Measure Time	≤ 10 s	
Solution	A Grade（JJF 1211–2008，dual–wave、multi–wave）	
Measure Methods	With SOP automatic measuring, automatic centering, automatic cleaning etc.	
Feeding	Automatic wet circulation dispersion sampling system	Automatic wet circulation dispersion sampling system & Automatic dry dispersion sampling system
Automatic Wet Circulation Dispersion Sampling System	◆ Water: 600ml, flow rate 3000–8000ml/min ◆ Solvent: 80 or 200ml, flow rate 1500–4000ml/min ◆ Automatic water intake, automatic cleaning, automatic drainage, overflow protection, etc. ◆ Ultrasonic: 50W adjustable power, with dry burn prevention design ◆ Bottom: Tilted design to prevent particle sedimentation; blade spindle designed to prevent particle aggregation ◆ Dual water level sensors	
Automatic dry dispersion sampling system	---	◆ Dispersion medium: Compressed air or inert gas ◆ Air compressor pressure: 0.1–0.8MPa, continuo–usly adjustable ◆ Gas flow rate: 400–6000L/min ◆ Sample quantity: 0.2g ~ 10g
Detectors	Located in front and side, total 80 purchase	Located front, side and back, total 92 purchase
Laser and lifetime	High–power fiber–optic laser, lifetime > 25000 hours	High–power fiber–optic polarized laser, lifetime >50000 hours
Report Format	PDF、BMP、Word、Excel、JPG	
Optical Path System	Single lens	Positive and negative Fourier, inclined sample cell
Refractive Index	×	√
Operation System and Interface	Win7/Win10；USB2.0 or 3.0	
Power Supply	100–240VAC，50/60Hz，4A	
Main-body Size and Weight	705mm × 318mm × 295mm；22 kg	705mm × 318mm × 295mm；23 kg
Optional Accessories	BGD 1140 ---- Solvent–based circulation dispersion sampling system(suitable for all organic solvent media, composed of stainless steel, polytetrafluoroethylene, and quartz sample cell, with a volume of 80mL) BGD 1141 --- Wet micro–testing window component (suitable for wet particle size testing of precious samples, with media including solvents, water, oil, etc.)	

Digital Abbe Refractometer

A refractometer measures the extent to which light is bent （i.e. refracted） when it moves from air into a sample and is typically used to determine the index of refraction （aka refractive index or n） of a liquid sample.

The refractive index is a unit-less number, between 1.3000 and 1.7000 for most compounds, and is normally determined to five digit precision.

The refractive index is commonly determined as part of the characterization of liquid samples, in much the same way that melting points are routinely obtained to characterize solid compounds. It is also commonly used to:

* **Help identify or confirm the identity of a sample by comparing its refractive index to known values.**
* **Assess the purity of a sample by comparing its refractive index to the value for the pure substance.**
* **Determine the concentration of a solute in a solution by comparing the solution's refractive index to a standard curve.**

BGD 252 Digital Abbe Refractometer can be used widely in petroleum, chemical, pharmaceutical, sugar refining and food industries, as well as in related colleges,universities and scientific research institutions for measuring the refractive index nD of transparent of sub-transparent liquid,or solid substance.it also can be used to measure the Brix(BX) of the sugar solution, and to correct the affect of temperature on the Brix automatically.

- ◆ Visual aim and LCD display
- ◆ Correct automatically effection of temperature on the Brix.
- ◆ Prism is made of hard glass
- ◆ RS232 interface

Main Technical Parameters：	
★ Measurement range（refractive index）：1.3000 – 1.7000	Concentration 0 – 95%
★ Measurement precision（refractive index）：±0.0002	Concentration ±0.1%
★ Min. reading（refractive index）：0.0001	Concentration 0.1%
★ Range of temperature correction：15℃ ~ 45℃	
★ Display scope of temperature：0 ~ 50℃	
★ Weight of instrument：10 kg	
★ Size：330mm × 180mm × 380mm	
★ **Ordering information:** BGD 252–––Digital Abbe Refractometer	



Density（Specific Gravity）Cups

The Density of a coating should remain constant from batch to batch. Also known as Density（Specific Gravity）Cups. Specific Gravity Cups are used to determine the specific weight per unit volume of a liquid at a given temperature.

A stainless steel precision instrument for determining the specific weight of paints and similar products. A tolerance of 0.1% is guaranteed. Testing is carried out in accordance with ISO at 23±2℃.

This instrument consists of a cylindrical container and cover with a hole for exhaust of excess liquid for any excess Paint（or Ink）to be removed when the cup cover is pressing tightly. By doing so, will also ensure that no air bubbles（or pockets of air）are being trapped.

It is in according with DIN 53217, ISO 2811-1, BS 3900 A19. And each density cup comes with Calibration Certificate.

Order information	Capacity	Unit	Material
BGD 296/1	37cc/mL	Metric	Stainless steel
BGD 296/3	50cc/mL	Metric	Stainless steel
BGD 296/5	100cc/mL	Metric	Stainless steel



Pressure Density Cup（Pyknometer）

BGD 297 Pressure Density Cup is designed to measure the liquid sample density with the minimum of error. Some paints that tend to pick up significant quantities of air during manufacture. This instrument operates on the principle of compressing the paint to such an extent that included air bubbles are reduced to a negligible volume. It can be used with materials containing up to 10% by volume of included air and is capable of results reproducible to better than±0.5%.

The instrument consists of a hollow cylinder with a plunger in one end and a pressure release cap at the other. Pressure can be applied to the sample of paint by advancing the plunger with the screw provided. Excess paint is forced out of the pressure release cap which is set at a value of 150 p.s.i. The instrument is so made that when the plunger is screwed home the volume of paint enclosed is that of 100ml.

In order to use the cup, the pressure release cap is removed and the plunger withdrawn to the full extent in order to give the cup its maximum capacity for filling. The cup is held vertically with the open end at the top and the paint to be tested is poured in until it is nearly full. The cup is then closed by replacing the pressure release cap.

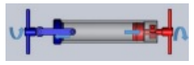
The paint is now compressed by advancing the plunger. When the pressure in the cup reaches 150 p.s.i. paint is forced out between the cup and the pressure release cap. When the plunger has been advanced to its full extent the paint in the cup is at a pressure of 150 p.s.i. and the volume is the same as 100ml（that of 100 gms. of water at 16.7℃） If the temperature is other than 16.7℃ there will be a small error due to the thermal expansion of the cup, which may be regarded as negligible if the temperature is between 12℃ and 20℃. The excess paint is washed away from the top of the cup and the whole instrument dried.

The weight of the paint remaining in the cup is obtained by weighing the cup and its contents and subtracting the tare weight of the cup.

It is made up of stainless steel and easy to clean. It conforms to ISO 2811-4 and BS 3900 A22. And each density cup comes with Calibration Certificate.

Main Technical Parameters：
★ Weight（Pressure density cup）: 1,200 g
★ Material: Stainless steel
★ Compression: 10 bar Volume 100mL
★ Accuracy: Valve: ±1 bar； Volume: ±1mL
★ Come with he calibration certificate
★ **Ordering information:** BGD 297---Pressure Density Cup





Sagging Tester

BGD 225 Sagging Tester produced by our company is in accordance with the specification of ISO 16882, ASTM D 3730.Customization is required to meet ASTM D4400 standards. They are made of corrosion resistant stainless steel, The width of application is 75mm at 6mm per sagging thickness, the gaps are being separated by a 1mm space as a marking on each sagging for distinctive identifications of each sagging.

They are applicable to determine the relative sag resistance of a series of paints in order to provide the technical parameters for the paint application in site.

Main Technical Parameters：					
★ Difference between adjacent two notches：25μm					
★ Overall dimensions：120mm×20mm×20mm（L×W×H）					
★ Come with Calibration Certificate					
★ Ordering information	BGD 225/1	BGD 225/2	BGD 225/3	BGD 225/4	BGD 225/5
Range	50–275μm	250–475μm	450–675μm	650–875μm	850–1075μm





Manual:

Drawdown the coatings on a material (glass, test chart or board) using the appropriates sagging Thickness Gauges, then place the coated material at vertical position (90°) to the platform (eg： table) .Allow 10 to 30 minutes (depending on the viscosity) for the coatings to sag under gravity. Check out the coating thickness without the sagging effect and the next coating thickness with the sagging effect. With that information, the recommended coating thickness is between the 2 layers of coatings.

Leveling Tester

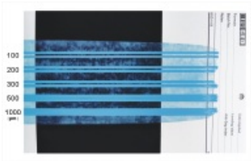
BGD 226 Leveling Tester is designed to determine the relative leveling of liquid coating materials before curing in the laboratory. （Coating materials have to eliminate surface defect during drying）. It comply with ASTM D2801-1994 （BGD 226/1）and NYPC（BGD 226/2）.

It is made of stainless steel with straight scraper fitted with 5 pairs of notches of increasing depth from 100～1000μm（or 250~4000μm ）.

Once the drawdown has been made on a horizontal, firm surface, leave the coating to cure Once the coating is dry, identify the thickness at which the pair of film stripes merge.

Main Technical Parameters：
★ BGD 226/1： for coating thickness 100–200–300–500–1,000μm
Overall dimensions： gate type 120mm×20mm×20mm（L×W×H）
★ BGD 226/2： for coating thickness 10–20–40–80–160 mils
Overall dimensions： gate type 120mm×20mm×20mm（L×W×H）
★ Come with Calibration Certificate
★ **Ordering information:** BGD 226/1---Leveling Tester（100–1,000μm）
BGD 226/2---Leveling Tester（10–160 mils）





Opacity

The terms "contrast ratio", "opacity" and "hiding power" are used interchangeably throughout the coatings industry but on this page, in order to simplify matters, only the term opacity will be used. Opacity is defined as the ability of a coating to prevent the transmission of light. A practical example of this is the case where a yellow wall is painted using a red paint. The greater the opacity the red paint, the more efficient it will be at hiding the underlying yellow colour.

Opacity is difined how a wet film of the test coating is applied to a black and white patterned substrate. After the film has dried, a reflectance meter or a spectrophotometer is used to measure the amount of light reflected from the overcoated black areas of the substrate. This is then expressed as a percentage of the amount of light reflected from the overcoated white areas. This value is the opacity of the film.

A paint which is highly opaque will obscure the black and white areas to an equal extent. In this situation, equal amounts of light will be reflected from the overcoated black and white areas and consequently an opacity value of 100% will be obtained.

① Pfund Cryptometer

BGD 298 Pfund Cryptometer offers a simple and accurate method to test wet film hiding power or determine thickness needed for complete opacity, It can gives estimate of coverage in square meters per liter and very be suitable for use with coatings containing pigments.

BGD 298 Pfund Cryptometer consists of a glass plate, half black half white as the base. Each half of this base has a scale engraved from 0-50mm along one edge starting from the division in the center. Two glass top plates are included with each instrument and these have two metal supports at one end so that these transparent top plates rest at an angle when placed upon the black and white area of the base plate.

The top plates differ in the length of their tiny supports so that different angles are formed between the top plates and the base plate. A wedge angle constant（K）is given to each top plate. These range from the smallest angle K=0.002 to K= 0.0035, K= 0.004, K= 0.007 and the largest K=0.008, the popular constants being K=0.004 and K=0.008.

How to Use your Cryptometer?

The appropriate top plate for the paint to be tested is selected, usually K=0.008 for light coloured paints and K=0.004 for dark coloured paints. (Alternatively, K= 0.002 for higher opacity coatings and K= 0.007 for less opaque coatings). A blob of paint, typically 3-5 ml is placed in the center of the base plate close to the black/white division. For light colours, the top plate (e.g. K= 0.008) is placed over the paint with the supports on the white area of the tile. The top plate is pressed down firmly so that the paint is spread without air bubbles to form a shallow wedge between the plates. This wedge will move with the top plate, the position of which is adjusted until the moment that the black/white division disappears. The scale reading is then noted from the black scale where the edge of the top plate makes contact with the base plate. When testing a dark coloured paint the top plate (e.g. K=0.004) is used and the scale reading taken on the white area.

The thickness of paint in millimeters over the black and white division is obtained by multiplying the scale reading times the wedge constant K of the top plate used. This figure records the minimum film thickness necessary to obscure the black and white. The coverage or spreading power for this thickness can be obtained directly from the conversion tables below for each of the top plates.

Main Technical Parameters：
★ Reflectance of white part：80 ± 2
★ Reflectance of black part：≤2
★ Weight：1.0 kg
★ Dimensions：100mm × 170mm × 20mm.（L × W × H）
★ **Ordering Information:**
BGD 298---Pfund Cryptometer
BGD 298/Z-001---Glass Plate（K=0.002）
BGD 298/Z-002---Glass Plate（K=0.004）
BGD 298/Z-003---Glass Plate（K=0.007）
BGD 298/Z-004---Glass Plate（K=0.008）
BGD 298/Z-005---Glass Plate（K=0.0035）



② Reflectance Meter

The **BGD 581** is a newly developed portable reflectometer featuring full touchscreen operation. It is widely applicable for measuring the hiding power of paints, varnishes, light-colored coatings, color pastes, pigments, and various colorants on substrates.

Features

- Confoms EN ISO 2814, ISO 6504-3, ASTM D2805, ASTM E97, DIN 55984, BS 3900-D6/D7
- Portable design for easy carrying and on-site measurements.
- 2.4-inch full-color touchscreen with clear display and simple, intuitive operation.
- Combined LED light source and dual-channel CMOS spectrophotometric sensor ensure higher testing accuracy.
- No zero calibration required, simple and convenient operation.
- Special moisture-proof design allows reliable use in harsh environments.
- Instant measurement, no warm-up time, stable readings with no drift, enabling fast results.
- Long-life light source (over 3 million measurements in 5 years) with no need for replacement.
- Nationally calibrated whiteboard ensures traceable and reliable measurements.

Main Technical Parameters：
★ Optical Geometry: 45°/0°
★ Measurement Aperture: ϕ8mm
★ Measurement Range: 0–200.00%
★ Resolution: 0.01%
★ Measurement Repeatabilit≤0.1%
★ Zero Drift: ≤0.1%/10min
★ IndicationDrift:≤0.1%/3min
★ Power supply: Rechargeable lithium battery (supports 8 hours of continuous operation or 5,000 measurements)
★ Dimensions: 150mm × 50mm × 75mm
★ Net Weight: 300g
★ **Ordering Information:**
BGD 581---Reflectance Meter





③ Opacity Meter/ Intelligent Reflectometer

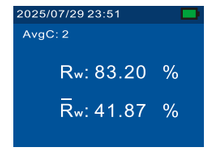
The BGD 582 Opacity Meter is our latest next-generation product, designed with a 45° /0° optical geometry (45° annular uniform illumination, 0° reception) to comply with ISO 6504-3 "aints and varnishes Determination of hiding power Part 3: Determination of contrast ratio of light-coloured paints at a fixed spreading rate.sures the degree to which light is scattered due to internal or surface irregularities in a material, resulting in a "cloudy" or "milky and ASTM D2805-21 "Standard Test Method for Hiding Power of PaitsbyReflectometrysures the degree to which light is scattered due to internal or surface irregularities in a material, resulting in a "cloudy" or "milkyAdditionally, it automatically calculates the contrast ratio (C = Rb/Rw) of samples.

Features

- Confoms EN ISO 2814, ISO 6504-3, ASTM D2805, ASTM E97, DIN 55984, BS 3900-D6/D7
- Portable design for easy transport and on-site measurements.
- 2.4-inch full-color touchscreen with clear display and user-friendly operation.
- Combined LED light source and dual-channel CMOS spectrophotometric sensor for higher accuracy.
- No zero calibration required，simple and efficient operation.
- Special moisture-resistant construction ensures reliable performance in harsh environments.
- Instant measurement, no warm-up time, stable readings with no drift for fast results.
- Long-life light source (over 3 million measurements in 5 years) with no replacement needed.
- Nationally calibrated reference tiles for traceable and accurate measurements.
- Automatic calibration, self-checks zero point and white standard.
- Average measurement mode for consistent data.
- Automatic contrast ratio (C) calculation.
- USB interface for direct data export，no additional software required.

Main Technical Parameters：
★ Optical Geometry: 45° annular illumination, 0° reception
★ Light Source: D65
★ Observer Angle: 10°
★ Measurement Aperture: ϕ8mm
★ Reflectance Range: 0–200.00%
★ Reflectance Resolution: 0.01%
★ Reflectance Repeatability: ≤ 0.1%
★ Zero drift: ≤ 0.1%/10min
★ IndicationDrift: ≤ 0.1%/3min
★ Power supply: Rechargeable lithium battery (supports 8 hours of continuous operation or 5,000 measurements)
★ Dimensions: 150mm × 50mm × 75mm
★ Net Weight: 300g
★ **Ordering Information:** BGD 582---Opacity Meter





Drying Time

When developing a process, it is important to know the exact time it takes for the coating to dry or cure. There are many stages to the coating drying time. Once a coating has been applied, the first stage is that the coating levels off under gravity. Once a coating begins to cure, a thin dry film appears on the surface .

But how to know when a coating is totally dry?

Using the Biuged Drying Time Recorder, the operator can easily identify each of the stages of the drying process:

A ball tip is placed into the coating and, using the mathematical formula: Distance=Speed ×Time ; the Recorder begins to move this ball at a predefined speed. As the coating dries, the trace left in the coating by the ball identifies each stage of the cure.

① Line Drying Time Recorder

The various stages of drying and curing that occur in films are easy to detect but difficult to define in terms of chemical and physical principles. In order to evaluate them satisfactory, it is necessary to use instrumentation under controlled conditions.

Biuged offers a versatile drying time recorder to help quantify the various stages of film curing and drying, deliver reproducible results, and guarantee highest efficiency:

This reliable apparatus to test the drying time or gelation behavior of many paints and coatings, applied onto a glass strip of 330mm× 24mm by means of our cube applicator（BGD 203）. Hemispherical needles travel on these test tracks, over a selected time: 6,12 ,24 and 48 h.

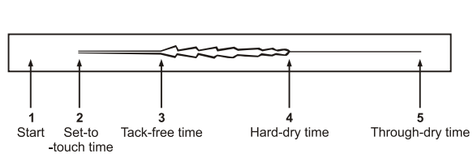
The drying time stages can be easily assessed with the graduation scale（according to traverse speed configuration）: The total time for every test can be observed from the LCD screen.

1. Evaporation of solvent: deep pear-shaped impression

2. Sol-gel transition: continuous track

3. Surface dry: interrupted track

4. Final dry time: the needle no longer penetrates the film



Stages of drying using a straight-line drying-time recorder

Main Technical Parameters：
★ Simultaneous testing of 6 samples – saves time
★ Four different speeds：6–12–24–48 hrs – for any application
★ Styli Diameter （with rounded tip）: 2mm ± 0.05mm （6 pcs）
★ Come with 6 pcs stainless steel weights（5 gram per weight） for recording through drying
★ Come with calibration certificate
★ Comply with standards：ASTM D 5895–03, ISO 9117–4
★ Overall Size：500mm × 220mm × 140mm（L × W × H）
★ **Ordering Information**：
BGD 261–––Line Drying Time Recorder
BGD 203–––Cube Applicator（see page 49）
BGD 261/Z–003–––Glass Panel Holder
BGD 261/W–006–––Glass Panel Set（330 × 24 × 3mm，Set of 60）





Procedure

--Coat the glass panels using BGD 203 film applicator （order separately below）
--The drying of the paint starts here. If you prepare multiple panels at different times, note the time when the draw down was made and add it to the time the sample is in the recorder
--Place recorder bridge in starting position and put the panels in place
--Place needles on the sample panel and select the speed by adjusting the speed switch
--Turn the recorder on the unit will automatically switch off at the end of the test
--Evaluate the results （see figure at right）


Glass Panel Holder

② Intelligent Line Drying Time Recorder

This is a powerful and intelligent line drying time recorder which can meets with all different requirements about analyzing different samples'drying performance. It has three dividual pairs of tracks（each channel has two working channels）. Comparing with BGD 261, BGD 262 Intelligent Line Drying Time Recorder has many features as below:

- ◆ Big size touch screen（5 inch）and shows three channels working parameters at the same time
- ◆ Very easy and convenient to set working parameters
- ◆ Broad and flexible time range: can be set varying from 4 minutes up to 48 hours. This makes the BGD Drying Time Recorder suitable for fast drying waterborne coatings as well as very slow drying paints that may need days to dry.
- ◆ Uses photoelectric sensor to accumulate and show real-time position, and can achieve accurate position which precisely corresponds to working time.
- ◆ With motor drive controlling system which has our own intellectual property to ensure high precision location.
- ◆ Traceback Function: By moving the stylus to the target position, the instrument can automatically calculate the corresponding test time at that point.
- ◆ Each channel has LED indicator light to show this channel is working or not.
- ◆ Come with 6 pcs stainless steel weights（5 gram per weight）for recording through drying
- ◆ Come with calibration certificate Comply with standards: ASTM D 5895-03, ISO 9117-4

Main Technical Parameters：
★ Working tracks：3 pairs individual tracks, each track includes two working channels
★ Setting range for working time：4 minutes–48 hours（Each track can be set individually.）
★ Styli Diameter （with rounded tip）: 2mm ± 0.05mm （6 pcs）
★ Power：200W
★ Overall Size：600mm × 430mm × 240mm（L × W × H）
★ Net Weight：27 kg
★ **Ordering Information:**
BGD 262–––Intelligent Line Drying Time Recorder
BGD 203–––Cube Applicator（see page 49）
BGD 261/Z–003–––Glass Panel Holder
BGD 261/W–006–––Glass Panel Set（330 × 24 × 3mm, Set of 60）



③ Minimum Film Forming Temperature （MFFT）Tester

Description: As the most important component--emulsions for coatings and polymer dispersions for coatings and plastics polymer, its film-forming property has important influence on final products drying property. Thus, knowing its MFT is very necessary.

In a certain temperature, emulsions or polymer dispersions, if the temperature is not high enough, then can't let the polymer particles polymerize. Now, all polymer particles can't get together any more and then form incontinuous and non-transparent white mass; If the temperature is high enough and let the particles get together, then can form continuous and transparent film.

White Point Temperature：The dividing temperature when non-transparent film change to transparent film.

Minimum Film-forming Temperature：The lowest temperature when forming continuous, uniform and no-crack film（Generally speaking, White Point Temperature has serval degrees lower than MFFT）

BGD 452 Minimum Film-Forming Temperature（MFFT）Tester is the newest instruments which is developed by Biuged lately, Its main structure is a metal（copper）platen with an electronically imposed temperature gradient. Built in temperature sensors monitor the temperature across the platen, a graph of the gradient is displayed on the touch screen. A cooling source and a heating source are located separately on the two ends of platen to produce different temperature gradient through metal heat conduction theory.

Applicate a continuous and uniform thickness wet film of emulsion or dispersions on the temperature gradient platen, then dry it by dry air, with temperature of platen influence, the water of sample would evaporate and form film. Due to different temperature on the platen, the film-forming position is also different. Find the dividing point between continuous transparent film with white non-transparent film, thus this point which also can be read from touch screen of tester is MFFT.

It is accordance with ISO 2115, ASTM D2354 standard, and can test minimum film temperature of emulsion polymer easily and accurately.

Features:

- ◆ Initiated in China, High-tech product, combine a lot of patents with independent intellectual property rights.
- ◆ Small size, high precision, intelligent operation, easy to use and maintenance.
- ◆ Color touch screen+menu operation system, all parameters can be shown in real time
- ◆ High precision digital temperature sensor, ensure the temperature error is less than ±1°C
- ◆ Come with cooling water tank
- ◆ Optional Dry Air Generator which can produce dry dew point air ,and can ensure sample can dry completely and test results don't be effected by environment hudmidity.
- ◆ Removable scale (with illumination) is convenient for operator to read any point temperature on the gradient platen. Operator can move the scale freely, then tester can identify automatically current position and show relevant temperature of this position.
- ◆ Monitor automatically cooling water temperature and flow, tester would stop working automatically once any exceptional conditions.
- ◆ Platen (Temperature gradient) is made of copper with special process, fast heat conduction and strong stability.
- ◆ System reminder operator automatically about the testing progress.
- ◆ Seven work conditions for selection, convenient to measure different film-forming temperature sample.
- ◆ 16 high temperature sensors is distributed on the gradient platen.
- ◆ Come with BGD 203/3 cube applicator (Gap Clearance: 100μm & 170μm) which can get the 100 micron continuous and uniform wet film with 22mm width.

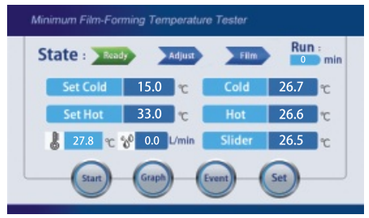
Main Technical Parameters：
★ Working temperature range of gradient platen：−10℃ ~ +90℃ (When cooled by common tap water)
★ Number of inspection points of gradient platen：16 points
★ Interval distance of gradient：20mm
★ Test channels：6 pcs (width is 22mm)
★ Gradient platen size：447mm × 210mm
★ Power Supply：220V/50Hz AC wide voltage (three−phase supply with good earth)
★ Tester Size：600mm (L) × 450mm (W) × 300mm (H)
★ Cooling water tank：560mm (L) × 240mm (W) × 200mm (H)
★ Dry Air Generator：555mm (L) × 255mm (W) × 525mm (H)
★ Net Weight：26 kg (Excludes Chiller and Dry Air Generator)
★ Power：750W
★ Ordering information:
BGD 452−−− Minimum Film−Forming Temperature Tester
BGD 452/Z−001−−− Dry Air Generator (750W)



Cooling water tank



Film Forming Point



Operation Menu



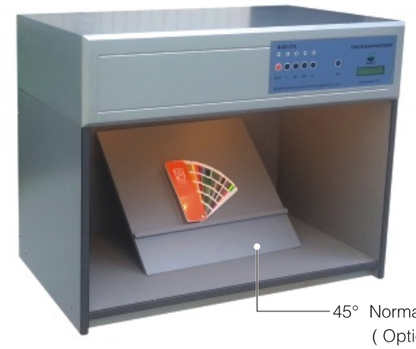
Color Assessment Cabinet

The cabinets provide different lights and are controlle 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

Main 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：35 kg
★ Dimensions：710 mm × 410 mm × 570 mm



★ 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

◆ Ordering Information

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

Optional accessories: BGD 1901---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.

Gardner Color Comparator with C Illuminant

Colour variations of transparent liquids such as varnishes, solvents, resins, tensides, oils etc., May be caused by contamina-tion or impurities, process inconsistencies, or excessive weathering.Therefore reliable and accurate measure-ments are essential to ensure consistent production standards.

BGD 425 Gardner Color Comparator with C Illuminant is used to test the color of drying fatty oil, varnish, fatty acid, polymerized fatty acids and resin. It complies with ISO 4630 standard.

Main Technical Parameters：

★ Working Standard：18 pcs different standard liquid color which are prepared according with ISO 4630

★ Glass tubes：Colorless and transparent with inner diameter is 10.65mm ± 0.025mm,external diameter is 12.5mm and the length is 114mm

★ Illuminant：Its energy of spectra is similar with C light resource of CIE. And the ray come through breadth wise the working standard color and sample

★ The environment is neutral color, the two working standard colors and one sample are within eye shot

★ **Ordering Information**：

BGD 425---Gardner Color Comparator with C Illuminant





Automatic Liquid Spectrophotometer

(Liquid Spectrophotometric Color Measuring Instrument)

Color of liquid is a critical quality control indicator for transparent materials such as resins, varnishes, clear oils and thinners. Traditional testing relies on visual comparison with physical standard color tubes including iron-cobalt, Gardner and platinum-cobalt sets. This method is highly susceptible to operator experience, eyesight fatigue and ambient lighting, leading to severe subjective errors. In addition, standard color tubes fade or get contaminated over time, resulting in high consumable costs and low testing efficiency, which fails to meet modern high-precision, traceable quality inspection requirements.

Our newly developed BGD 428 Automatic Liquid Colorimeter completely upgrades the conventional visual color comparison method. Before delivery, the instrument collects high-precision color data of full-series standard color tubes and digitizes mainstream color scales including platinum-cobalt, Gardner and iron-cobalt to build a built-in exclusive standard database. During testing, the device automatically captures chromaticity data of samples, intelligently matches the optimal color grade and directly outputs the standard c
olor number. Compared with manual visual comparison, this automatic liquid colorimeter features the following advantages:

◆ Conforms to ISO 4630-1, ISO 6272-2, ASTM D1500 etc. Standards

◆ Eliminates human error for higher accuracy: Free from visual judgment by human eyes and external subjective interference, it applies unified testing benchmarks to deliver stable, precise results without manual color discrimination deviation, realizing automated, digital and standardized liquid color measurement.

◆ No physical color tubes required to cut costs and maintenance: Eliminates repeated procurement, replacement and calibration of standard color tubes, avoids inaccurate measurement caused by tube aging, fading and contamination, and greatly reduces consumable and maintenance expenses.

◆ Multi-scale compatibility for multi-scenario application: Built-in universal industrial color libraries including iron-cobalt, Gardner and Hazen/APHA (Pt-Co) to support color testing of various liquid products with wide application coverage.

◆ Fast automatic testing for batch inspection: Fully automatic measurement with instant intelligent readout, no manual one-by-one comparison or recording required, significantly boosting efficiency for daily QC, batch sampling and production process control.

◆ Traceable data for full compliance: The digital color library is permanently solidified without attenuation or drift. All test data can be stored, queried and exported to satisfy national standards, ISO certification and quality traceability demands.

Beyond the above functions, the instrument can test liquid colors under various color spaces, and output transmittance, ASTM D1500 petroleum color scale, Saybolt color index, pharmacopoeia color standards (Chinese EP, European EP, United States USP), EBC beer color, ICUMSA sugar color and other chromaticity indices to fulfill diverse industrial testing demands.

Instrument Features

◆ 7-inch high-definition capacitive touch screen, displaying spectrogram, color difference values, color simulation, pass/fail judgment results, etc.; equipped with intelligent zero calibration function

◆ Professional optical system: Integrating integrating sphere D/0 diffuse illumination optical path, complying with domestic and international authoritative standards for transmittance color measurement of transparent and semi-transparent liquids

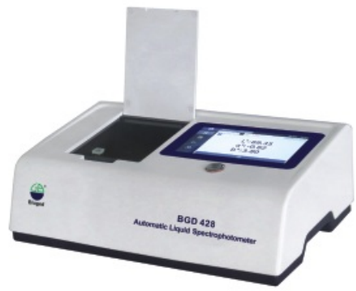
◆ Full-spectrum balanced LED light source: Covers 360~780nm with uniform spectrum without missing bands for stable testing; service life reaches over 3 million measurements (approx. 5 years)

◆ High-precision sensing system: Dual 40-group silicon photodiode array sensor with planar grating spectroscopy, complet-ing one measurement in merely 0.8 seconds

◆ Preloaded with 41 international standard light sources, supporting 2° /10° dual observer angles to reproduce real color performance under diverse application environments

◆ Full-range built-in chromaticity indices (see Technical Specifications for details)

◆ Matching SQCX PC quality management software; the instrument connects via USB or Bluetooth to realize remote measurement control, batch data storage, automatic test report generation and customizable function expansion





Main Technical Parameters：

★ Illumination Mode: Transmittance D/0 (diffuse illumination, viewing at 0°), approximate 0/0 parallel illumination as specified in CIE No.15. Complies with ASTM D1003/D1044, CIE No.15, ASTM E308, DIN5033 Teil7, etc.

★ Illumination Light Source: Combined full–spectrum LED light source

★ Integrating Sphere Size: ϕ40mm; Spectroscopy Method: Planar grating spectroscopy

★ Measuring Wavelength Range: 360nm–780nm, wavelength interval 10nm, half bandwidth 5nm

★ Transmittance Measuring Range: 0~200%

★ Supported Color Spaces: CIE LAB, XYZ, Yxy, LCh, CIE LUV, Musell, s–RGB, HunterLab, △xy, DIN Lab99, CMYK

★ Color Difference Formulas: △Eab, △Euv, △E94,△Ecmc(2:1), △Ecmc(1:1), △E00, DIN△E99, △E(Hunter), △ECH

★ Additional Chromaticity Indices: Transmittance T; Whiteness WI (algorithms including ASTM E313, CIE/ISO, AATCC, Hunter, Taube, Berger, Stensby); Yellowness YI (ASTM D1925, ASTM E313); TI; Metamerism Index Mt; Staining fastness, color change fastness, absorbance; APHA/Hazen/Pt–Co index, Gardner index, iron–cobalt index, Saybolt index, ASTM D1500 petroleum color scale, Chinese Pharmacopoeia, European Pharmacopoeia, United States Pharmacopoeia, EBC beer color, ICUMSA sugar color

★ Observer Angles: Optional 2° and 10° dual modes

★ Viewing Light Sources: Total 41 types including D65, A, C, D50, D55, D75, F1–F12, CWF, DLF, TL83, TL84, TPL5, U30, B, U35, NBF, ID series and multiple LED light sources; partial light source modes require supporting PC software

★ Single Measurement Time: Approx. 0.8s in fast mode

★ Repeatability: Spectral transmittance standard deviation ≤0.05% (≤0.04% for 400~700nm); chromaticity △Eab ≤0.015 (measured at 5s intervals after warm–up calibration)

★ Inter–instrument Agreement: △Eab ≤0.25

★ Overall Dimension: L370mm × W255mm × H140mm Net Weight: Approx. 4.9 kg Power Supply: DC 24V, 3A power adapter

★ Light Source Service Life: Over 3 million cumulative measurements, up to 5 years under normal operation

★ Device Interfaces: USB port, printing serial port

★ Data Storage Capacity: 1000 standard samples, 10000 test samples; massive data storage supported by PC software

★ Standard Accessories: Power adapter, operation manual, SQCX quality management software (download from official website), data cable, transmittance black plate, 10mm cuvette, 50mm cuvette, dedicated fixture for 50mm cuvette

★ Optional Accessories: Mini thermal printer, 4mm micro–aperture transmittance test fixture assembly, 30mm cuvette, 100mm cuvette, fixture for 100mm cuvette, Bluetooth adapter, sample heating controller

★ **Ordering Information**: BGD 428--- Automatic Liquid Spectrophotometer

pH Meter

Acidity and Alkalinity must be considered when design coating formula! Digital pH Meter can display the pH of sample directly and quickly. Low cost plus high performance offers laboratory quality control for a very economical cost.

It is Ideal for all kinds of water quality, chemical testing in the laboratory and soil/fertilizer testing. Suitable for most ASTM and ISO test procedures. Great for R&D and QC applications in chemical industries and related fields.

① Pen Portable pH Meter

It is designed like a pen and more convenient to use anywhere and anytime!

◆ Best function: automatic calibration, automatic temperature compensation, automatic power off, low voltage alarm, pH electrode invalidation display, etc.

◆ Easy to use: single button operation.

◆ Reliable structure design: meet IP57 waterproof, replaceable batteries, calibration solution, electrode soaking solution and standby batteries in a portable case.

Main Technical Parameters:

Ordering Information → Parameters ↓	BGD 287	BGD 288
Measuring range	0 ~ 14.0 pH	−1.00 ~ 15.00 pH
Resolution	0.1 pH	0.01 pH
Accuracy	± 0.1 pH	± 0.01 pH
Stability	±0.1 pH/3h	±0.01 pH/3h
Temp. compensation range	0 ~ 60℃ (Automatic)	0 ~ 60℃ (Automatic)
Show Temperature	No	Yes
Auto.Calibration	1 Point (pH7.00)	1 ~ 3 point (pH4.00/7.00/10.01)
Power	CR2032 lithium batteries × 2, continuous use for over 100 hours	
Dimension	148mm × 29mm × 14mm	
Weight	43g	



Optional Accessories:

BGD 1171/5----Plastic three-in-one combination pH electrode (for BGD 287/BGD 288)

② Table pH Meter

Description: The pH Meter is widely used in the field of chemical industry. In the coating and related industries, accurately measuring the pH value of formula system or raw materials is one of the most basic works.

According to customers' different requirements, Biuged offers basic, precise and professional pH Meters with firm and durable design (IP54 waterproof). The pH Meter comes with pH composite electrode, electrode stand, dust cover and standard powder sachets, and has the functions of automatic shutdown, power-off protection and factory reset.



BGD 281



BGD 282



BGD 283

Ordering Information→ Main Technical Parameters ↓	BGD 281 Basic pH Meter	BGD 282 Precise pH Meter	BGD 283 Professional pH Meter
pH Range	0.00 ~ 14.00	−2.00 ~ 18.00	−2.000 ~ 20.000
pH Resolution	0.01	0.01	0.001
pH Accuracy	± 0.01	± 0.01	± 0.002
Temperature Range	-----	−5.0℃ ~ 110.0℃	−10.0℃ ~ 135.0℃/14.0oF ~ 275.0oF
Temperature Resolution/Accuracy	-----	0.1℃/ ± 0.2℃	0.1℃/ ± 0.1℃
Display Screen	High resolution LCD display screen, 6.0 inches		High resolution LCD display, 5.7 inches
pH Calibration Points	1−2 points	1−3 points	1−5 points
pH Standard Recognition	Automatically recognize three pH standard solutions (4.00, 6.86, 9.18), and support for pH standard solution customization.		Selectable pH buffer groups, including NIST, DIN, USA, MERK. Can manage standard solution groups. Support for pH standard solution and groups customization (data management and information tracing).
Temp. Compensation	Manual temperature compensation		Automatic/Manual temperature compensation
Other Functions	Reading Prompts: Reading, Stable, Locked	Determine the endpoint intelligently, can set the balanced measurement mode and continuous measurement mode. With data storage (50 sets) , querying and delete functions.	Chinese or English operation window. Determine the endpoint intelligently. Multi−reading feature allows auto−read, timed−read and continuous−read. With data storage (500 sets), querying, delete, transfer and print functions. User ID and sample ID can be set. GLP−compliant,data can be traced. Support for USB or RS−232 communication. Support firmware upgrade function, allowing function expansion and customization requirements.
Dimensions/Weight	200mm × 160mm × 63mm /600g	242mm × 195mm × 68mm/900g	
Power	AC Adapter, 100V−240V AC input, DC9V output		
Optional Accessories	BGD 1171/0−−−E−201F pH Composite Electrode (for BGD 281) BGD 1171/6−−−E−301−QC 3 in 1 pH Composite Electrode (for BGD 282, BGD 283) BGD 1173/1−−−962221 Ultrapure Water pH Composite Electrode (for organic solvents) BGD 1173/2−−−962102 Cleanable pH Composite Electrode (for emulsion, suspension, viscous, etc)		

Standard Solution

Product Name	Ordering Information	Description
pH4.00 buffer	BGD 1170/1	500mL/250mL（bottle）
pH6.86 buffer	BGD 1170/2	500mL/250mLL（bottle）
pH7.00 buffer	BGD 1170/3	500mL/250mL（bottle）
pH9.18 buffer	BGD 1170/4	500mL/250mL（bottle）
pH10.01 buffer	BGD 1170/5	500mL/250mL（bottle）
84 μS/cm conductivity standard	BGD 1174/1	500mL/250mL（bottle）
1413 μS/cm conductivity standard	BGD 1174/2	500mL/250mL（bottle）
12.88 mS/cm conductivity standard	BGD 1174/3	500mL/250mL（bottle）



③ Portable pH Meter

The most cost effective portable pH, suited for industrial and mining factories, power plant, water treatment project, environmental protection industry, etc, especially suited in field and on-site

◆ Built-in microprocessor chips, intelligent functions such as automatic calibration, automatic temperature compensation, data storage, function set-up, self-diagnose information, automatic power-off and low voltage display.

◆ Automatic identification of 13 pH standard calibration solutions, three options of standard buffer solutions: Europe and America series, NIST series and China series.

◆ Able to set pH measurement modes of high purity water and pure water with ammonia.

◆ Equipped with calibration solution and portable case and suited in field and on site.

◆ Meter meets IP57 waterproof rating

◆ Can store 200 groups data （Series number, measuring value measuring unit and temperature）

◆ Meter meets IP57 waterproof rating

◆ Can store 200 groups data （Series number, measuring value measuring unit and temperature）

Main Technical Parameters：
★ Measuring Range： –2.00 pH~19.99 pH；
★ Resolution：0.01pH；
★ Accuracy： ±0.01 pH
★ Stability： ±0.01 pH/3h
★ Temp. compensation range：0℃～100℃，automatically
★ Power：Two AA batteries (1.5V×2)
★ Meter size and weight：120mm×65mm×31mm（L×W×H）；180 g
★ Package size and weight：360mm×270mm×76mm（L×W×H）；1.6 kg
★ Standard kit includes：
BGD 289 pH/mV meter （1 unit）
Plastic pH three–in–one combination electrode （1 pc）
pH standard buffer solution（pH4.00, pH7.00 and pH10.01）/50mL（3 bottles）
Spare AA batteries （2 pcs）
★ **Ordering Information：**
BGD 289–––Portable pH Meter
BGD 1171/3–––Plastic three–in–one combination pH electrode
BGD 1172/4–––Glass pH electrode for oil sample （used to organic solvent, ink and coating）



Digital Electrical Conductivity Meter

Conductivity meter is used widely to determine the level of impurities in water supplies for domestic consumption as well as industrial use. Industries that employ this method include the chemical, semi-conductor, power generation, hospitals, textile, iron and steel, food and beverage, mining, electroplating, pulp and paper, petroleum and marine industries.

Specific applications include chemical streams, demineralizer output, reverse osmosis, stream boilers, condensate return, waste streams, and boiler blow down, cooling towers, desalinization, laboratory analysis, fruit peeling and salinity level detection in oceanography.

It is used to measure the capacity of ions in an aqueous solution to carry electrical current. As the ranges in aqueous solutions are usually small, the basic units of measurements are milli-siemens/cm （mS/cm）and micro Siemens/cm（μS/cm）.

① Table Conductivity Meter

Description: Conductivity is also called electrical conductivity, which is the main parameter used to describe the fluidity of positive charge in a liquid. Generally, it is used to measure the purity of water. The conductivity of water has a certain relationship with the amount of inorganic acid, alkali and salt. When the concentration is low, the conductivity increases with the increase of concentration. Therefore, this index is often used to estimate the total concentration or salt content of ions in water. In the coating industry, electrical conductivity is an important parameter for water paint.

Features:

◆ High resolution LCD display screen, 6.0 inches.

◆ Automatic shutdown, power-off protection and factory reset. The meter is IP54 waterproof.

◆ Equipped with conductivity electrode, electrode stand, dust cover for intelligent detection and automatic recognition.

◆ Determine the endpoint intelligently, can set the balanced measurement mode and continuous measurement mode.

◆ Automatic/Manual temperature compensation

◆ Automatically recognize four conductivity standard solutions, also can calibrate the conductivity electrode at one point.

◆ Automatic frequency switching, equipped with 1.0 constant electrode to cover the full range measurement data management and information tracing.

◆ With data storage (50 sets), querying and delete functions.

Main Technical Parameters：
★ Conductivity Range: 0.00 μS/cm ~ 200.0mS/cm
★ Resolution: 0.01 μS/cm minimum, various with range selection
★ Accuracy: ±1.0%F.S.
★ Temperature Range: –5.0℃ ~ 110.0℃
★ Temperature Resolution: 0.1℃
★ Temperature Accuracy: ±0.2℃
★ Power: AC Adapter, 100V–240V AC input, DC9V output
★ Dimensions/ Weight: 200mm×160mm×63mm/600g
★ **Ordering Information:**
BGD 291–––PreciseTable Conductivity Meter
BGD 1175/5–––DJS–1VTC Conductivity Electrode



② Portable Conductivity Meter

BGD 293 portable conductivity Meter is used widely for laboratory or field measurement of the conductivity of liquid.

◆ Built-in microprocessor chips, intelligent functions such as automatic calibration, automatic temperature compensation, data storage, function set-up, automatic power-off and low voltage display.

◆ Automatic identification of 8 conductivity standard calibration solutions, two options of standard calibration solutions: Europe and America series and China series.

◆ Adopt advanced conductivity measurement technology, use conductivity electrode of constant K=1, only need one point calibration and meet the measurement precision requirement of 0.5μS/cm ~ 200 mS/cm.

◆ Ability to switch among conductivity, TDS, salinity and resistivity. Multinomial calculation for TDS and salinity to ensure the conversion precision of the full scale.

◆ Conductivity measurement mode has the function of non-linear temperature compensation for high purity water.

◆ Plastic conductivity electrode with automatic temperature compensation, fast response and accurate result.

◆ Meter meets IP57 rating waterproof standard, equipped with calibration solution and portable case.

Main Technical Parameters：
★ Measuring range： 0 ~ 2 × 10^5 μ S / cm
★ Resolution： 0.01/0.1/1 μ S/cm； 0.01/0.1 mS/cm
★ Accuracy： Meter: ± 1.0% FS, Overall: ± 1.5% FS
★ Temp. compensation range： （ 0 ~ 50 ）℃（ Automatic ）
★ Data storage： 200 groups
（ Series number, measuring value measuring unit and temperature ）
★ Power： Two AA batteries (1.5V × 2)
★ Meter size and weight： 120mm × 65mm × 31mm （ L × W × H ）； 180g
★ Package size and weight： 255mm × 210mm × 50mm （ L × W × H ）； 790g
★ Standard kit includes：
BGD 293 pH/mV meter （ 1 unit ）； Plastic conductivity electrode （1 pc）
1,413 μ S/cm conductivity standard solution (50mL)； Spare AA batteries （ 2 pcs ）
★ **Ordering Information：**
BGD 293---Portable Conductivity Meter
BGD 1175/3---Plastic Conductivity Electrode
BGD 1176/3---Glass Conductivity Electrode



③ Portable pH&Conductivity Meter

BGD 290 is a double-parameter meter, it is equipped with pH electrode and conductivity electrode, automatic identification of electrode by meter.

All features and parameters are same as BGD 289 Portable pH meter and BGD 293 Portable conductivity meter.

◆ Standard kit includes:

① BGD 290 pH/mV/Conductivity meter（1 unit）

② Plastic conductivity electrode（1 pc）

③ Plastic pH/ATC three-in-one combined electrode（1 pc）

④ 1,413μS/cm conductivity standard solution（50mL）

⑤ pH standard buffer solution（pH4.00, pH7.00 and pH10.01/50mL）

⑥ Spare AA batteries（2 pcs）

◆ **Ordering information:** BGD 290--- Portable pH/Conductivity Meter



Fast Moisture Tester（Non-volatile-matter Content Tester）

These new Moisture Analyzers are ideal for routine moisture analysis requiring precise results. They combine high quality and durable construction into a sleek, compact design and offer dependable, accurate results for a wide variety of moisture analysis applications.

These series of moisture analyzers can not only be used for rapid determination of non-volatile content in materials such as paints, varnishes, resins, various paint bases, and polymer dispersions, but are also widely applied in industries including pharmaceuticals, food & beverage, agriculture, chemicals, and environmental protection.

◆ With a large capacity of 110 grams or 90 grams, it is ideal for food, agriculture, chemical, pharmaceutical and other applications that require measurements up to 0.01% (0.001g).

◆ Simple to Operate Set up and operation is extremely easy. Just press and hold buttons to set drying parameters.Is ideal for routine tasks performed by operators of all skill levels.

◆ Compact, Easy-to-Clean Design The compact footprint is designed to take up less space.

◆ The easy-to-clean heating chamber is ideal for frequent use and inexpensive maintenance.



MB 25ZH



MB 23ZH



MB 32ZH

Ordering Information → Technical Item ↓	MB23ZH	MB25ZH	MB32ZH
Capacity（ g ）	110	110/99	90
Readability（ g ）	0.01	0.01/0.005	0.001
Repeatability（ 3g sample ）	0.3%	0.2%	0.15%
Heating Source	Infrared	Halogen	Carbon fiber IR
Temperature Range	50℃ ~ 160℃（@5℃）		40℃ ~ 180℃（@1℃）
Min. Sample（ g ）	0.5		
Pan Size（ mm ）	ϕ90		
Endpoint Control	Timing, Automatic		A30, A60, A90, Timing (1–480mins), Manual
Heating Time	1 min. ~ 60 min.（@ 30s ）; 60 min. ~ 90 min.（@ 1min. ）		
Display Contents	Water Content %, Solid Content%, Weight, Time, Temp., Moisture Ragain %（only for32ZH ）		
Overall Size (L × W × H),mm	280 × 165 × 127		210 × 138 × 352
Net Weight（ kg ）	2.1		4.3

Intelligent Percentage Volume of Non-volatile Matter Tester

For paints and varnishes, the percentage of volume of non-volatile matter plays a vital guiding role in their application. Conventional test methods (density method, disc/plate gravimetric method) are cumbersome to operate and tend to produce highly scattered test results.

The BGD 196 **Intelligent Percentage Volume of Non-volatile Matter Tester**, newly developed by Biuged, is a fully automatic intelligent instrument. Adopting non-contact laser scanning principle, it only requires a tiny drop of sample to measure the volume solids of coatings rapidly, easily and precisely.

The instrument is standardly equipped with 9 coded sample preparation substrates and three four-sided applicators of different specifications. Operators coat films of specified thicknesses on the substrates according to sample properties or actual test requirements, then place the substrates into the designated scanning position inside the instrument. After scanning, remove the samples and cure them following the actual drying process of the sample, then reinsert them for a second scan. The instrument will automatically calculate the percentage volume of non-volatile matter of the sample.

In addition, operators can create test groups within the system to quickly and conveniently manage all relevant test data.

Features

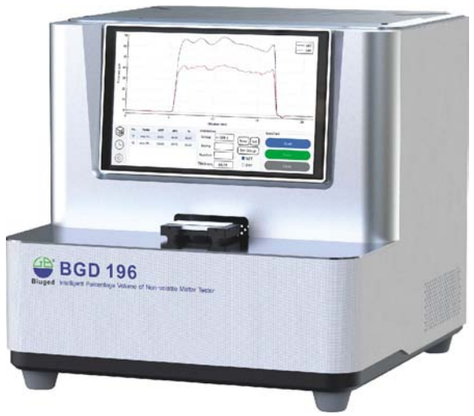
◆ Standard configuration: 9 coded standard sample preparation substrates + three four-sided wet film applicators with gap clearance ranges (50μm-100μm-150μm-200μm, 250μm-300μm-350μm-400μm, 450μm-500μm-550μm-600μm)

◆ Built-in panel identification system for automatic sample number recognition

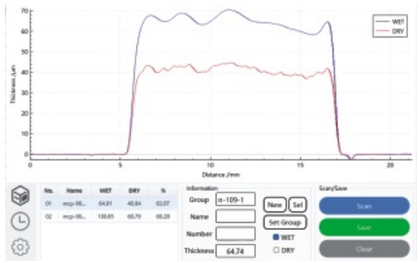
◆ The panel identification system paired with user-friendly data management system supports unlimited test panels per batch without risk of data confusion

◆ Fully automatic measurement with simple operation. Compared with traditional gravimetric methods, it drastically shortens test duration while delivering high measuring accuracy and excellent repeatability, providing stable and reliable data support for coating production quality control and painting cost control

◆ Compatible with translucent and fully transparent samples without extra configuration, satisfying test demands for all types of coatings



Main Technical Parameters：
★ Optimal Scanning Film Thickness Range: 30 μ m–1,200 μ m (recommended coated wet film thickness: 100 μ m)
★ Scanning Resolution: 0.01 μ m
★ Volume Measurement Accuracy: ±0.5%
★ Volume Measurement Repeatability: ±1.0%
★ Test Result Repeatability: 3%
★ Overall Size (L × W× H): 410mm×375mm×370mm
★ Net Weight: approx. 20 kg
★ **Ordering information:**
BGD 196–––Intelligent Percentage Volume of Non–volatile Matter Tester



Operation Windows

Automatic-Intelligence Karl Fischer Titration Tester （Volumetric Method）

There is always a little water in organic liquid, solvent and solvent based paint or ink, but it would be able to affect the whole quality of coatings. Using Karl Fischer Titration to determine free water and water of hydration in most solid or liquid organic and inorganic compounds is general method in chemical field.

The sample, containing a maximum of 100 mg of water, is dissolved or dispersed in a suitable liquid and titrated with KF reagent, which consists of iodine, sulfur dioxide, organic base, and a solvent (typically an alcohol, such as methanol, ethylene glycol, or 2-methoxyethanol). The titration end point is determined potentiometrically with a platinum electrode which senses a sharp change in cell resistance when the iodine is reduced by sulfur dioxide in the presence of water.

BGD 231 Automatic-Intelligence Karl Fischer Titration Tester, consisting of a titration cell, dual platinum electrode, magnetic stirrer, dispensing buret and control unit, is the latest instrument developed by Biuged with independent intellectual property rights. It uses the newest mechanical and electronic design technology and user-friendly interface operation. Compared with the last version, it has higher measurement accuracy, wide measurement range, simple operation, durability, and reliability. It can be widely used for the precise determination of crystalline water, adsorbed water, and free water in solvent-based coatings, inks, adhesives, solvents, and other chemical products.

◆ Complies to ISO 760, ISO 6296, ASTM E203

◆ Compatible with various Karl Fischer reagents, automatically replaces solvents and discharges waste liquids to prevent the escape of toxic reagents.

◆ The titration cell, solvent bottle, and reagent bottle are all equipped with drying tubes. The pipeline joints and seals are made of corrosion-resistant materials to prevent the infiltration of environmental moisture.

◆ Absorb solvent and discharge waste liquid automatically, titrate automatically, keep titration end point automatically, calculate and analyze results（consumption amount of reagent, water mass, percentage, ppm ）automatically.

◆ Show titration curve, deducting blank values

◆ Status lights indicate whether the instrument is working or ready. Calibration, sample measurement, and test results are saved automatically.

◆ Stepless speed-adjustable stirring reaction vessel for more thorough titration.

◆ The instrument automatically tracks environmental water drift during idle time and selects drift deduction during result calculation to ensure accurate analysis results

◆ Adjusts the titration liquid speed automatically during titration based on the water content in the titration cell, displaying real-time titration liquid volume, titration speed, and electrode signal during the titration process.

◆ In-built stylus printer

Main Technical Parameters：
★ Theoretical Measurement Range: 0.001% ~ 100%
★ Optimal Measurement Range: 0.01% ~ 100%
★ Titration Accuracy: 1.0 μ L
★ Repeatability: ≤0.5 %（20 mg water）
★ Resolution: 1ppm
★ Storage: 100 groups for titration data; 5 groups for calibration records; 5 groups for test methods.
★ Power Supply: 110V ~ 240V/50HZ ~ 60HZ
★ Overall Size/Weight: 450mm × 400mm × 400mm/5.5 kg
★ **Ordering Information:**
BGD 231––– Automatic–Intelligence Karl Fischer Titration Tester



Note: Use Karl Fischer Titration Tester to measure trace water content of solvents or paints, anhydrous methanol and Karl Fischer reagents are necessary. Biuged don't offer these reagents because of delivery problems. Customers can buy it from local suppliers of Chemical reagents.

Gas Chromatograph

Description of Gas Chromatography Technology Basic Working Principle:
Samples in gaseous, liquid, or solid states are introduced via specific injection methods into the vaporization chamber and then delivered to the chromatographic (separation) column system. Driven by the carrier gas (N_2), the mixture components in the sample flow through the chromatographic column. Under the action of the stationary phase within the column, the components in the sample are separated. The separated individual components, carried by the carrier gas, enter a system known as the detector. Within the detector, these components undergo a non-electrical conversion process, transforming chemical components into electrical signals (current or voltage) proportional to their concentrations. These electrical signals, corresponding to each component, are then sent to a recording instrument or data acquisition and processing system, enabling qualitative and quantitative analysis of the components in the mixture.



Characteristics

- Economical and practical, offering high cost-effectiveness
- Unitized integrated structural design, facilitating installation and maintenance
- Compatible with chromatography data workstations, significantly improving work efficiency
- Equipped with a Hydrogen Flame Ionization Detector (FID) provides high sensitivity for organic compound analysis, suitable for detecting solvent residues and solvent components in printed materials
- Designed with a capillary column injection port
- Spacious column oven (300×300×200mm): Ensures accurate completion of complex analytical tasks using capillary chromatographic columns
- Advanced noise suppression system: Completely eliminates fan noise during chromatographic operation, providing a quiet and comfortable working environment
- Fully glass-lined injection assembly with two modes: rapid vaporization and on-column injection
- New pressure stabilization and multi-flow path system: Utilizes a dual-flow path design and a novel pressure stabilization system to ensure instrument reproducibility
- Microcomputer-controlled with user-friendly interface for simple operation
- Advanced temperature control system: Microcomputer-controlled, allowing interactive setting of various required temperatures, including column oven temperature
- Overheat protection function: Allows setting of any temperature within 400℃, with dual safeguards through software program protection and hardware circuit design
- Employs a chromatography workstation for data processing, enabling extensive data storage and providing specialized analytical methods

Main Technical Parameters:

- ★ Temperature Control Range: RT + 10℃ to 400℃, with 8-ramp program heating
- ★ Heating Rate: 0 – 30℃/min (in increments of 0.1℃/min)
- ★ Temperature Control Accuracy: ≤ 0.1℃; Temperature Control Precision: 0.1%
- ★ Main/Accessory or Optional Components:
  - ① Hydrogen Flame Ionization Detector (FID)
  - * Detection Limit: Mt ≤ 1×10^{-11} g/s (using n-hexadecane)
  - * Baseline Drift: ≤ 1×10^{-12} A/0.5h * Noise: ≤ 1×10^{-13} A
  - ② Thermal Conductivity Detector (TCD)
  - * Sensitivity: S ≥ 2500 mV · ml/mg (using benzene)
  - * Baseline Drift: ≤ 60 μV/0.5h * Noise: ≤ 10 μV
  - ③ Electron Capture Detector (ECD)
  - * Detection Limit: M≤ 2×10^{-13} g/ml (using r-666)
  - ④ Flame Photometric Detector (FPD)
  - * Detection Limit: Ms≤ 5×10^{-13} g/s (using thiophene, for sulfur)
  - * Mp≤ 5×10^{-13} g/s (using ethyl parathion, for phosphorus)
  - ⑤ Nitrogen Phosphorus Detector (NPD)
  - * Detection Limit: Mn≤ 5×10^{-13} g/s (for nitrogen, using ethyl parathion)
  - * Mp≤ 5×10^{-13} g/s (for phosphorus, using ethyl parathion)
- ★ Detectable Substances: Benzene, Cyclohexanone, Xylene, Ethanol, Ethylbenzene, Isopropanol, Propanol, Butanol, Ethyl Acetate, Isopropyl Acetate, n-Butanol, Toluene, n-Butyl Acetate, Fenamiphos, 4-Methyl-2-pentanone, among others.
- ★ Standard Configuration: ① Main Unit × 1 ② Hydrogen Flame Ionization Detector (FID) × 1 set ③ Chromatographic Column × 1 ④ Data Workstation × 1 set ⑤ Professional Software × 1 set ⑥ Installation Accessories × 1 set ⑦ Sample Injector × 1 set ⑧ Headspace Vials × 50 ⑨ Sealing Caps/Crimps × 50 sets
- ★ Overall Size (L × W × H): 500mm × 430mm × 440mm Net Weight: 50 kg
- ★ **Ordering Information:** BGD 266---Gas Chromatography

Hydrogen-Air-Nitrogen Generator

Description: The Hydrogen-Air-Nitrogen Generator (Gas Generator) is a compact, integrated unit combining a nitrogen generator, hydrogen generator, and air compressor. It features a compact structure, simple operation, and built-in multi-level protection devices, making it suitable for providing stable, high-quality, and safe gas supplies to gas chromatographs.

Characteristics

- Can replace high-pressure gas cylinders, modernizing the laboratory setup.
- Simple operation with stable output pressure, equipped with flow display.
- Does not consume electrolyte solute; only requires periodic replenishment with distilled water.
- Safe, reliable, and convenient performance, featuring multiple protection devices.
- Capable of long-term continuous operation.

Main Technical Parameters:

- ★ Nitrogen Purity: > 99.999%; Hydrogen Purity: > 99.999%
- ★ Air Quality: Dry, oil-free, triple-purified clean gas
- ★ Output Flow: Nitrogen, Hydrogen→ 0– 300 mL/min; Air→ 0–2,000 mL/min
- ★ Output Pressure:
  - • Hydrogen→ 0–0.4 MPa (Factory set: 0.3 Mpa)
  - • Nitrogen→ 0–0.5 MPa (Factory set: 0.4 Mpa)
  - • Air→ 0–0.4 Mpa
- ★ Power Supply: 220 V ± 10%; 50 Hz ± 5%
- ★ Operating Environment: Temperature: 10℃–40℃; Relative Humidity: ≤85%; Environment: Free from excessive dust and corrosive gases
- ★ Power Consumption: 330 W
- ★ Dimensions: 460 mm × 440 mm × 370 mm; Net Weight: Approx. 40 kg
- ★ Standard Configuration: Main Unit × 1; Spare Parts Kit × 1 set; Power Cord × 1
- ★ **Ordering Information:** BGD 1098---Hydrogen-Air-Nitrogen Generator



Small-Sample Closed-Cup Flash Point Tester

What is the **Flash Point**?

Flash Point is the lowest temperature, as measured in the prescribed manner, of the test portion corrected to a barometric pressure of 101,3 kPa, at which application of an ignition source causes the vapour of the test portion to ignite momentarily and the flame to propagate across the surface of the liquid under the specified conditions of test.

BGD 240 Small-Sample Closed-Cup Flash Point Tester is designed according to rapid equilibrium closed cup method. It can rapidly test flash point for paints, including water-borne paints, varnishes, binders for paints and varnishes adhesives, solvents, petroleum, and related products.

It conforms to ISO 3679, ISO 3680, ASTM D3278, ASTM D3828 etc.

Characters

- Can detect the flash point at a specific temperature between -35℃ and 105℃ （BGD 240/1）or RT to 300℃（BGD 240/2）at average rate heating.
- All functions are achieved through touch screen and digital display.
- Built in two test procedures: Rapid equilibrium and Non-equilibrium（Fixed value）
- Various parameters, such as the heating mode, time, temperature and the average rate heating can be set by the user themselves.
- Planning board action, the decline of the ignition, the detection of flash point is done automatically.
- The gas ignition sources can be provided directly by the laboratory, you can also use the portable butane gas tank.
- Built-in cooling module is used to shorten the cooling time between the two tests.
- Amend barometric pressure automatically



Ordering Information → Technical Parameters ↓	BGD 240/1 Low Temp. Small-Sample Closed-Cup Flash Point Tester	BGD 240/2 Normal Temp. Small-Sample Closed-Cup Flash Point Tester
Measurement Range	–35℃ ~ 105℃	Room Temp.（RT）~300℃
Tested Flash Point Temperature Accuracy	±0.5℃（≤100℃）; ±2℃（>100℃）	
Sample volume	2 mL	2 mL/4 mL
Cooling Method	Built–in cooling module (with external cooling water, flow rate > 1L/min)	Air–cooled
Heating Rate	User–defined, with a maximum heating rate of 5℃ per minute.	
Output Interface	USB, U Disc	
Operate Temperature	15℃ ~ 35℃	
Power Supply	220/240V, 50/60Hz	
Overall Size	460mm × 330mm × 350mm（L × W × H）	
Net Weight	15 kg	
Come with Accessories	Steam source regulation component, Silicone tube, injector, Thermometer, O–Type Seal Ring（5pcs）	
Optional Accessories	Injector for high viscosity sample, Stand oil of Flash Point, Cooling Water Machine	

Automatic Interfacial Tension Tester

This instrument is designed with ISO 6295, ISO 1409, ASTMD1417, EN14370 etc "Test Methods for Interfacial Tension of Petroleum Products between Oils and Water （Ring Methods）". It is suitable to determine interfacial tension between mineral oils and water under non-equilibrium conditions (Liquid-liquid interface). It can also be used to determine surface tension of various liquids （liquid-gas interface）.

Features:

- With a advanced electromagnetic balanced force sensor, operator can get high precise and reproducible testing results.
- Big （5"）touch screen can show the current environment temperature, current tension, peak tension, the equivalent tension tec, easy to operate.
- Built in two testing methods---platinum ring and platinum plate, operator can choose anyone or both
- Full automatic operation can eliminate all human error. Platinum plate can lock liquid interface automatically, platinum ring shows tension curve, and peak tension will be locked automatically, without any conversion, the screen tension will shows the values directly.
- Calibrate automatically in full range: weights weight, pure water tension and ethanol tension
- With an elaborate ball screw, the lifte system don't have any noise, and its rising & falling speed can be adjusted.
- The lifting bracket is designed to install and disassemble platinum ring and platinum plate easily. Operator can calibrate force value anytime by standard weight
- Peeling function by one button, no drift for zero point and no beat for showing data
- Automatic compensation for environment temperatutre: taking the water and ethanol as standard , the tester converts automatically the sample's tension value under 20 ℃
- Data collection software for optional







Ordering Information → Technical Parameters ↓	BGD 234/1	BGD 234/2
Measurement Range（mN/m）	0–1000	0–1000
Resolution（mN/m）	0.1	0.01
Accuracy（mN/m）	0.1	0.01
Repeatability（mN/m）	0.1	0.01
Balance Precision（g）	0.001	0.0001
Testing Methods	Design platinum plate and platinum ring, can choose anyone or both	
Operation Methods	Touch operation, sample plate lift automatically, convert automatically	
Showing Method	5 inch coloured touch screen	
Weighing system	Electromagnetic balance	
Automatic Calibration	Yes	
Data Processing Software	Optional	
Mini-printer Interface	Optional	
Testing Time	In 10 seconds for platinum plate, 50 seconds for platinum ring	
Optional Accessories	BGD 1090---Platinum Plate, BGD 1091---Platinum Ring The instrument comes standard with one of these options (user's choice).	

Contact Angle Measuring Instrument

Introduction: Contact Angle, it refers to the tangent line of gas-liquid interface at the intersection of gas, liquid and solid phases. The tangent angle θ between the tangent line on liquid side and the solid-liquid boundary.

BGD 190 Contact Angle Measuring Instrument is mainly composed of five parts: light source, injection unit, sample table, acquisition system and analysis software. The equipment adopts the principle of optical imaging and measures the following parameters by image profile analysis.

◆ The wetting behavior of liquid on solid surface, such as spreading, infiltration, absorption, etc. The static contact angle is measured by sessile drop method.

◆ Measurement of advancing contact angle(ACA), receding contact angle(RCA), contact angle lag, rolling angle(tilt platform is required) and dynamic contact angle of material on solid surface.

◆ Continuous real-time study and process record of absorbing materials, analysis of contact angle variation curve with time.

◆ Contact angle measurements of various special materials, such as powders, curved surfaces, super hydrophobic/ super hydrophilic samples.

◆ Test of the contact angle of the material immersed in the liquid by the attachment drop method(quartz sample cell is required).

◆ Measurement of surface tension, polarity and dispersion components of various liquid meters by pendant drop method.

◆ Count surface free energy and analysis of polar dispersion components.

◆ Analyze the adhesion of liquid on solid surface, evaluate the uniformity and cleanliness of solid surface, etc.



Features

◆ Conform to standards: ASTM D724-99(R-2003), ASTM D5946-2004, ISO15989, etc

◆ The host adopts the high-strength aviation aluminum alloy structure to be matched with the modular design concept and self-developed integrated chip circuit control, which can be comparable to similar international top brands.

◆ Adopt industrial dense adjustable LED cold light source system (life span more than 25000 hours). The uniform light emission ensures clearer imaging and avoids droplet volatilization caused by additional heat.

◆ The injection unit adopts micro manual button injection, which is stable and accurate.

◆ The three-dimensional manual fine tuning platform is adopted, which is flexible in operation and accurate in positioning. The sample table can be customized according to the actual sample size.

◆ Adopt high-performance SONY industrial chip original imported from Japan, and 0.7~4.5 times high definition industrial grade continuous ploidy microscope imported from Germany (Max. 60 frames) with 2000W pixels, which can ensure the authenticity of images and obtain the best imaging effect.

◆ USB2.0 standard interface is adopted, with fast data transmission speed and high compatibility.

◆ The first contact angle measurement calibration sample imported from Germany is provided in China to ensure the accuracy of the instrument. The angle calibration standard sheet is 3° /5° /8° , 60° /90° /120° , 115° (optional).

◆ The design of the acquisition system is flexible, suitable for most of the measurement environment, and simple to deal with a variety of complex sample surface measurement.

◆ Has the most advanced contact angle analysis method in the world, which can meet the accurate fitting of all kinds of droplet imaging, including our company's unique differential ellipse and differential circle special liquid imaging fitting method.

◆ Using the international leading calculation method, the software has realized automatic fitting to avoid the error caused by human operation.

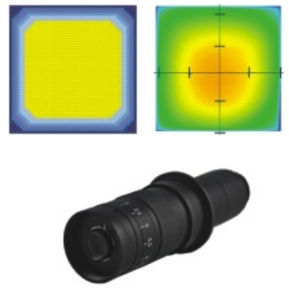
◆ With the function of fast fitting of bilateral contact angle measurement, it can comprehensively analyze the surface wetting performance of liquid and solid, and more accurately analyze the actual wetting situation of the surface.

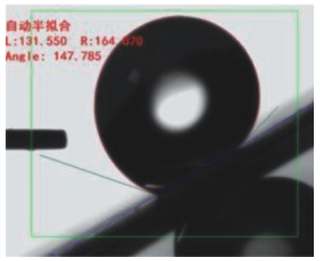
◆ Dynamic shooting, video fast test data, can continuously record the change of test contact angle, and then automatically batch fitting by the software.

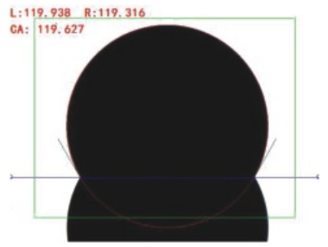
◆ The most advanced contact angle measurement and analysis software in China is automatic fitting method (one-button automatic fitting, no artificial error), including: Circle method, Ellipse/Oblique ellipse, LY, Differential circle / Differential ellipse; Dynamic contact angle fitting (batch fitting of multiple images) includes: Wettability, Video analysis; Surface energy; Adhesion work.

◆ The software automatically generates reports, which cover various data reports such as Word form, Excel form and Spectrograms, etc.

◆ A variety of accessories can be selected to expand other functions and applications.







Main Technical Parameters：
★ Contact angle measurement range: 0 ~ 180°
★ Contact angle resolution measurement accuracy: ±0.001°
★ Testing accuracy of contact angle: ±1°
★ Surface free energy: Zisman, OWRK, WU, WU 2, Fowkes, Antonow, Berthelot, EOS, Adhesion work, Wet work, Spreading coefficient.
★ Dynamic contact angle fitting: batch screenshot fitting, video continuous automatic fitting and automatic online real–time fitting.
★ Surface/interface tension test: Pendant Drop method (real–time full–automatic dynamic surface tension test)
★ Droplet state test: Pendant Drop, Sessile Drop (2/3 state), Captive Bubble, Sessile Drop, Sessile Needle
★ Advancing contact angle & receding contact angle: method of increase and reduce the drop volume automatically measures the change of advancing angle and receding angle.
★ Spectrogram shows: left contact angle, right contact angle and average contact angle
★ Injection unit: special precision syringe with capacity of 500 μ L, hand–operated rotary liquid inlet (the drop accuracy can reach 0.1 μ L), the movement range of the injection unit is 50mm up and down, 50mm left and right.
★ Acquisition system adjustment: front and rear 60mm, adjustable viewing angle
★ Working table size: 120mm × 150mm
★ Max. width of sample: 200mm (unlimited length)
★ Adjustable range of working table movement (manual, precision 0.1mm): forward and rear stroke 60mm, left and right stroke 35mm, up and down stroke 80mm
★ Standard configuration: digital camera CMOS, high–definition constant–magnification light tube, video cable, dongle, supporting software, power cord, micro–sampler, round horizontal ball, one each; stainless steel needle(equipped with micro–injector), 0.51mm plastic needle (equipped with 1mL syringe), 1.6mm plastic tension needle (equipped with 1mL syringe), and five hex wrenches respectively; ten 1mL syringes
★ Optional Accessories: thin film fixture, standard film, sample cell, hydrophobic treatment solution, quantitative injection pump, temperature control platform, vacuum platform, electrostatic fan, manual tilt platform, micro injection pump, needle syringe, high–speed camera
★ **Ordering Information:** BGD 190–––Contact Angle Measuring Instrument

Application

Film Application

For numerous products such as paint, ink, varnishes, glue and cosmetics, the reliability of many laboratory tests is dire-ctly related to the quality of the samples prepared for it.

It is absolutely essential that any measurements made on such coatings, whether for the purpose of describing their appearance or their physical properties （color, gloss, hiding power, drying time, etc.）, Are made on the basis of uniform and comparable samples with precisely controlled thickness.

In order to meet such specific demands, Biuged company has a wide range of high quality, high precision film applicators and motorized film applicators for greater repeatability and reproducibility when undertaking a large number of sample tests.

Stainless steel and anodized aluminum are the preferred materials of construction, due to their resistance to corrosion.

All applicators are marked with gap clearance, this gap clearance isn't wet film thickness.The theoretical wet film thickness is etched onto every applicator.Generally speaking:

- ◆ Gap clearance is from 15~100μm, the theoretical wet film thickness is 50% of gap clearance
- ◆ Gap clearance is from 100~300μm, the theoretical wet film thickness is 60% of gap clearance
- ◆ Gap clearance is from 300~500μm, the theoretical wet film thickness is 80% of gap clearanc
- ◆ Gap clearance is more than 500μm, the theoretical wet film thickness can reach 90% of gap clearance

How to choose suitable applicator:

- ■ Low viscous paint: BGD 202, BGD 203, BGD 204 Frame-type Applicator
- ■ High viscous paint: BGD 201, BGD 205, BGD 206 One or four-sided applicator
- ■ Flexible substrate like foils: Wire Bar coaters
- ■ Re-coating or Multiple coating: Wire Bar Coaters

Biuged accepts any order for customized special applicators!

① One-sided Applicator

The Bar-Type One-Sided Applicator is made using modern technology of metallurgy with a precision grinding machine. The accuracy of the gap depth is ±1.0μm（50μm and below）and or 2% of Full Scale. It is designed with ASTM D 823-25 and ASTM D 3022

It is made of high-grade, corrosion-resistant stainless steel 440C.

Main Technical Parameters：	
★ Effective Wet Film Width: 100mm	
★ The total length: 130mm	
★ **Ordering Information:**	
BGD 201/1：25μm	BGD 201/2：37.5μm
BGD 201/3：50μm	BGD 201/4：75μm
BGD 201/5：100μm	BGD 201/6：125μm
BGD 201/7：150μm	BGD 201/8：200μm
BGD 201/9：250μm	BGD 201/10：300μm
BGD 201/11：350μm	BGD 201/12：400μm
BGD 201/14：500μm	BGD 201/15：600μm





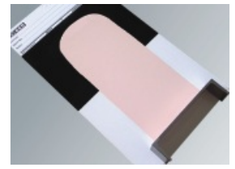
② Two-sided Applicator

The U shaped-Type Two-Sided Applicator is made using modern technology of metallurgy with a precision grinding machine. The accuracy of the gap depth is ±1.0μm（50μm and below）and or 2% of Full Scale. It is designed with ASTM D 823-25

It is made of high-grade, corrosion-resistant stainless steel 440C.

Main Technical Parameters：
★ Wet Film Width of：80mm
★ The total length：100mm
★ **Ordering Information:**
BGD 202/1：（25μm, 50μm）
BGD 202/2：（75μm, 100μm）
BGD 202/3：（150μm, 200μm）
BGD 202/4：（300μm, 400μm）





③ Cube Applicator

This small applicator is available with 12.7 film width （overall width respectively 25mm）. It has 2 gap sizes, machined into each application face. Ideal for application of parallel film stripes. This applicator is recommended for use in conjunction with BGD 261 Drying time recorder.

Main Technical Parameters：
★ Wet Film Width of：12.7mm
★ The total length：25mm
★ **Ordering Information:** BGD 203/1：（38μm, 76μm）
BGD 203/2：（75μm, 150μm）

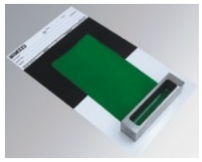


④ Four-sided Applicator（Frame-Type）

The Frame-Type Four-Sided Applicators are designed for the production of uniform films of paint, adhesives and similar products on plane substrates. They combine the accuracy of fixed applicators with the versatility of multiple gap choice in one unit. These applicators are suitable for use of aqueous, acid, and alkaline products.

It is made of high-grade, corrosion-resistant stainless steel 440C.

Main Technical Parameters：
★ Wet Film Width of：80mm
★ The total length：100mm
★ **Ordering Information:**
BGD 204/1：（5μm, 10μm, 15μm, 20μm）
BGD 204/2：（25μm, 50μm, 75μm, 100μm）
BGD 204/3：（50μm, 100μm, 150μm, 200μm）
BGD 204/4：（30μm, 60μm, 90μm, 120μm）





③ Four-sided /Eight-sided Applicator

A flexible and easy to use applicator, combining 4 gaps or 8 gaps size in one unit. The cylindrical shape provides excellent results particularly on firm substrates and smooth surface. By simply rotation through 90 angles, the next gap size is placed onto the test surface. It is designed with ASTM D823-25 and made of high-grade, corrosion-resistant stainless steel 440C.

Main Technical Parameters:

★ Wet Film Width of: BGD 205→160mm; BGD 206/207→80mm;

★ The total length: BGD 205→190mm; BGD 206/207→100mm;

★ **Ordering Information:**

Universal Type

BGD 206/1: (5μm, 10μm, 15μm, 20μm)
BGD 206/2: (25μm, 50μm, 75μm, 100μm)
BGD 206/3: (50μm, 100μm, 150μm, 200μm)
BGD 206/4: (30μm, 60μm, 90μm, 120μm)
BGD 206/5: (100μm, 200μm, 300μm, 400μm)
BGD 206/6: (50μm, 75μm, 100μm, 150μm)
BGD 206/7: (100μm, 150μm, 200μm, 250μm)
BGD 206/8: (250μm, 500μm, 750μm, 1000μm)

Long Type

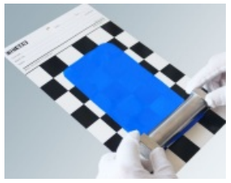
BGD 205/2: (25μm, 50μm, 75μm, 100μm)
BGD 205/3: (50μm, 100μm, 150μm, 200μm)
BGD 205/4: (30μm, 60μm, 90μm, 120μm)
BGD 205/5: (100μm, 200μm, 300μm, 400μm)
BGD 205/6: (50μm, 75μm, 100μm, 150μm)
BGD 205/7: (100μm, 150μm, 200μm, 250μm)
BGD 205/8: (250μm, 500μm, 750μm, 1000μm)

Eight-sided Type

BGD 207/2: (25μm, 50μm, 75μm, 100μm, 150μm, 200μm, 300μm, 400μm)



BGD 206





BGD 205

⑤ Square Applicator

This applicator is designed as square type, and its eight sides are precisely machined different gap depth. Maximize customers' satisfaction of applicating different wet film thickness

It is made of high-grade, corrosion-resistant stainless steel 440C.

Main Technical Parameters:

★ Wet Film Width of: 80mm

★ Applicator Size:

★ **Ordering Information:**

BGD 208/1: (0.5mils,1mils,1.5mils,2mils,3mils,4mils,5mils,6mils)
BGD 208/2: (1mils,2mils,3mils,4mils,5mils,6mils,7mils, 8mils)
BGD 208/3: (5mils,10mils,15mils,20mils,25mils,30mils,40mils,50mils)



⑥ Micrometer Adjustable Applicators

The blade of this applicator can be accurately adjusted by means of 2 micrometric screws, from 0 to 5 mm, in 10 μm increment. Suitable for various precision tests, e.g. research tasks. 4 widths available. These applicators uses magnetic blades, operator can pull and plug directly, easy to clean. Furthermore, these blades are made of stainless steel hardend by special technology, more wearability and corrosion-resistant greatly extend the life of applicators.

Main Technical Parameters

Ordering Information → Technical Parameters ↓	BGD 209/1 BGD 209S/1 (Digital)	BGD 209/2 BGD 209S/2 (Digital)	BGD 209/3 BGD 209S/3 (Digital)	BGD 209/4 BGD 209S/4 (Digital)
Setting Scope	0 ~ 5000μm			
Precision	10μm			
Blade Width (Wet film width)	50mm	100mm	150mm	200mm









Magnetic Blade

⑧ Wire-wound Rods

The wire and its rod from the wire-wound rods are made of stainless steel, which are corrosion-resistance. A coating （Paint or Ink）is being drawdown by a known thickness wire-rod applicator over a substrate（eg. Black/White Test Chart, Glass or Wood Panel, etc.）onto our Drawdown Board. The motion of the drawdown is done by gripping the 2 edges of the applicator or by using the Holder

These applicators provide an economical way to assure the uniformity of thickness of very thin films.

- Bar and wire manufactured of stainless steel
- Perfect for very thin films, e. g. foils and paper coating tests
- Ideal for flexible materials such as paper, cardboard, test charts, foils, leather, textiles, etc.
- Maximum attainable wet film thickness engraved on bar end
- Simultaneous drawdown of several samples side by side is possible

Main Technical Parameters:

★ Effective Wire-Wounding Length: 200mm

★ Bar Total Length: 240mm

★ Theoretical Wet Film Thickness (μm) available:
6-8-10-12-15-20-25-30-40-50-60-80-100-120-150-200

★ Bar Diameter: 10mm

★ **Ordering Information:**

BGD 212/6---6μm Wire-wound Rod
BGD 212/8---8μm Wire-wound Rod
.....
BGD 212/150---150μm Wire-wound Rod
BGD 212/200---200μm Wire-wound Rod
BGD 212/Z-001---Holder for Wire-wound Rod
BGD 216---Wire-wound Rod set 4 (includes any 4pcs different size wire bar coaters, a holder and a carrying case)



BGD 212



⑨ Formed Rods

Traditional wire bar coaters are wire-wound rods (twine rods with steel wires), the fine wire on the surface is easily loosed or broken, and it is not easy to clean and neither use to make the ultra-thin coating.

To solve this problem, Biuged develops a new product-Formed Rods. These rods are made by a precise mould, as well as implied with the cold extrusion technique to make the uneven wary curve on its surface, which makes it has the same coating results with traditional wire bar coaters.

Features:

- Machined by CNC with precise mould, the deviation of groove depth and space is lower than 2μm, which gets more uniform film.
- The service life will be longer without broken or loosen steel wires.
- Smooth curving surface makes it easier to clean.
- Realizing the ultra-thin coating, the thinnest wet film can reach 6μm, which makes it known as super wet film coater.







Main Technical Parameters

Products Name	Ordering Information	Coating Width	Rod Length	The length of holding part	Optional Theoretical Wet Film Thickness (μm)
Regular Formed Rods	BGD 214	200mm	240mm	20mm/20mm	6–8–10–12–15–20 25–30–40–50–60–80 –100–120–150–200
Extended Formed Rods	BGD 215	300mm	400mm	47mm/47mm	

Optional Accessories: BGD 212/Z–001–––holders (suitable for BGD 214)

Note: All rods produced by Biuged are distinguished by its wire diameter or groove depeth. For example, we mark 1.0mm wire diameter as 100 um wire–wound rod, 100 um is only theoretical wet film thickness, and the achieved fact wet film thickness is only 75% ~ 80% of theoretical value.

Automatic Film Applicator

Drawdown made by hand can show irregularities caused by variations in speed and pressure on the applicator tool. The quality of the drawdown will be dependent on the shear rate and the weight on the applicator. Measurements of film properties such as abrasion resistance, hiding power and gloss are greatly affected by the application quality.

The new automatic film applicators will guarantee a linear and even movement of the film applicator repeatable and high quality results are guaranteed:

① Drawdown Plate

Provides an economical and convenient means for making drawdowns of uniform film thickness.

It consists of a glass clip board set firmly on a phenolic plastic panel. The entire apparatus is mounted on rubber supports is order to eliminate sliding while in use. The drawdown surface is 6.4mm thick polished glass, equal in planarity to fine mirror glass. A steel clip holds the chart firmly while the drawdown is made. The workable area is equal to the size of the glass plate.

- Easy to use and easy to clean
- Holds charts securely for drawdowns
- Helps to achieve uniform results

★ **Ordering Information:**

BGD 2608–––Drawdown Plate（Glass plate size 299×381mm）



② Vacuum Film Applicator Bed

These drawdown vacuum plates are machined from hard aluminum solid stock and finished with grey hardcoat anodized that gives a high durability with corrosion resistance that will dramatically increases wear and longevity of the vacuum plate. The top section of the plate has a series of holes. When attached by a hose connection to a vacuum pump or sink aspirator, the vacuum created holds down paper charts during application of wet coatings with any type of film applicator.

Each plate comes complete with a chrome plated brass ball valve with an easy on/off lever handle to enable or disable vacuum, and includes a high quality vacuum pump.

★ **Ordering Information:**

BGD 217/1––– Vacuum Film Applicator Bed
Overall size: 360mm × 250mm × 32.5mm
Area with hole size: 290mm × 190mm
BGD 217/2––– Vacuum Film Applicator Bed
Overall size: 533mm × 340mm × 32.5mm
Area with hole size: 430mm × 270mm

We also accept other special size vacuum bed order!!



③ Automatic Film Applicator

Automatic Film Applicator enables experimental chemists to conveniently draw down precise coating film on the different substrates so as to reduce and eliminate errors caused by manual factors. Factors affecting the draw down are the shear rate and downward force applied to the applicator tool. It greatly improves the reproducibility of paint film.

BGD 218 and BGD 219 are the newest automatic film applicators, comparing the traditional products, they have:

- Wide-range stepless speed regulation: 5mm/s ~500mm/s
- High precision linear guides to ensure the draw down speed be more stable.
- The push rod can self-adapt to substrates of different thicknesses (0-20mm).
- The substrate clamping fixture can be repositioned based on test panel dimensions, adapting to various substrate sizes.
- Detachable platform design for easy replacement and cleaning of various platforms.
- The meticulously designed coating film holder simplifies operation and allows flexible load capacity expansion to accommodate easily bendable test panels
- Can set the starting point freely, is suitable for different size substrates
- Applicable to all Biuged's different type and size applicators and wire bars

◆ Better repeatability for applicating film：

For BGD 218: special precise machining vacuum suction-gas plate with high smooth precision (Whole plate 's flatness is less than 5 micron) and special hardening treatment, ensure all kinds of substrat could be adsorbed smoothly and tightly.

For BGD 219: Special precise machining glass plate with high smooth precision (Whole plate 's flatness is less than 20 micron),easy to clean.

◆ Optimal design for vacuum plate to ensure suction power is distributed uniformly (only BGD 218).

◆ External vacuum pump eliminate all shake coming from traditional structure (put pump into machine) (only BGD 218).



BGD 219



BGD 218/2T



BGD 218/1

Ordering Information → Technical Parameters ↓	BGD 218/1 BGD 218/1T (with heating)	BGD 218/2 (Extended) BGD 218/2T (Extended & heating)	BGD 219
Method of Fixing Substrate	Vacuum adsorption		Clamp
Applicating Platform	Hard anodic oxidation aluminum with vacuum holes		Glass
Draw down Bed Size	340mm × 250mm	470mm × 250mm	340mm × 250mm
Vacuum Bed Size with Hole	290mm × 190mm	410mm × 190mm	---
Max. application length	320mm	410mm	320mm
Applicating Distance	Settable freely		
Adjustable Draw down Speed	5mm/s ~ 500mm/s （Stepless Speed Regulation）		
Carriage Holder Weight	500g × 2（1kg or 1.25kg is optional）		
Total Power	500W / 2100W（TS type）		50W
Temperature Range	RT+5℃ ~ 100℃ / ±5℃（only for TS type）		---
Power Source	220V；50Hz		
Weight	28kg/26kg	35kg/33kg	25kg
Overall Size（No vacuum pump） （L × W × H, mm）	560 × 360 × 230	690 × 360 × 230	560 × 360 × 230

Table Water-curtain Spray Cabinet （All stainless steel）

As the paint sprayed from the gun can not completely cover on the work, so it produces great amount of poisonous coating mist when spraying the works. To keep the air not polluted and protect the workers' health, we produce a Table Water-curtain Spray Cabinet for small scale spraying in labs.

This spray cabinet applies the latest design plan, using the negative pressure principle, the dental plate and arc plate produce strong air flow when working, and makes the water becomes eddy to wash the indrawn coating mist, the gas will be exhausted by the fan, and the paint residue left in the water.

In addition, the whole spray cabinet is made of stainless steel and equipped with high-pressure contrifugal fan, and it possesses small footprint, easy operate, safe, easy clean and so many other characters, it is a new and favorable environmental protection equipment. This spray cabinet is capable to directly splash the residual coating mist to the water pool or water curtain, the processing efficiency up to over 90%. The smell and residual coating mist produced during the spraying will be filtered by the water curtain and exhausted outside the spraying room through the fan, so as to realize the cleansing of the spraying environment and the protection of people's health, as well as increasing the cleanliness of the works.

Structure Introductions:

① **Coating mist collecting system:** consists of stainless steel water-curtain plate, annular tank, water-curtain, and dash plate. Water-curtain plate, made of 1.5mm thickness stainless steel, facing towards operator. Water flows on its surface without break and pounding, maintaining a 2mm thickness water film. Most coating mist fully mixed with the water on the water curtain then flow into the annular tank, then filtered by the filter in the inlet of annual water pump.

② **Water supply system:** consists of annual water pump, valve, overflow channel and pipes.

③ **Exhausting system:** Consists of Baffle-type steam separator, centrifugal exhaust fan, several exhaust pipe and fan holder, belonging to large flow and low thickness exhaust. Steam separator with maze structure fixed behind the water-curtain plate, capable to efficiently separate and condense the mist in the air, then flow back to the annual tank in case over lost fluid.

Main Technical Parameters：

- ★ Overall Size: 810 × 750 × 1160（L × W × H, mm）
- ★ Working Room Size: 600 × 500 × 600（L × W × H, mm）
- ★ Exhaust Air Rate: 12m/s
- ★ Fan: Single-phase centrifugal fan, power 370W
- ★ Water curtain Size: 600mm × 400mm（L × W）
- ★ Samples holder Size: 595mm × 200mm（L × W）
- ★ Power Supply: 220V 50HZ
- ★ Length of Air Duct: 2m
- ★ Ordering Information:

  BGD 228---Table Water-curtain Spray Cabinet





Automatic Panel Spray Cabinet

When conducting coating performance tests, laboratory personnel need to prepare a large number of test panels with uniform and consistent coatings. However, the finish of traditional manual spraying largely relies on the operator's experience and skill. It is difficult to guarantee coating uniformity and consistency, especially when spraying large-area test panels. In addition, improper spraying operations pose certain hazards to operators' health and the surrounding environment.

To address these challenges and with reference to competing products on the market, Biuged has developed a fully **Automatic Panel Spray Cabinet** featuring the following advantages:

◆ Integrates automatic spraying and dry-type spray filtration technologies with an enclosed spraying chamber, fully isolating operators from paint mist for improved occupational health and environmental protection (BGD 227/V only);

◆ Equipped with an air intake filtration system for the working chamber to prevent external contaminants from interfering with the spraying process (BGD 227/V only);

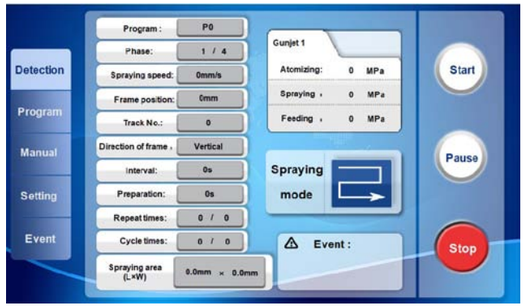
◆ Unique dual exhaust filtration unit treats waste gas generated during atomization, minimizing environmental pollution from spraying operations (BGD 227/V only);

◆ Fitted with imported Graco automatic spray guns supporting automatic adjustment of multiple spraying parameters, including spray width, atomization, material feed pressure, and ultra-precise coating flow rate;

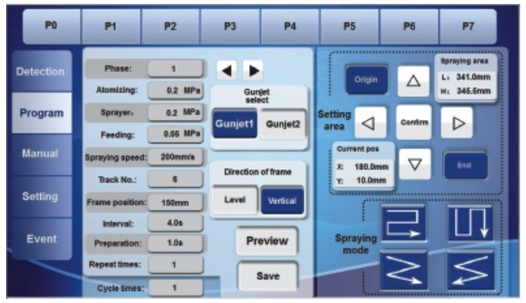
◆ Quick-detachable automatic spray guns enable fast replacement of different gun models;

◆ Pressure-feed spray gun design delivers easier flow adjustment compared to gravity-feed and suction-feed guns. The coating output remains stable and precise independent of the gun's supply air (atomization) pressure;

◆ 10-inch touchscreen control with powerful visual operation interface;



◆ Multiple editable and storable spraying programs are available. Pre-set intlligent spraying programs allow operators with limited spraying experience to complete spraying with one click;



◆ Servo control system supports horizontal, vertical and cross spraying patterns. The spraying area can be freely defined to reduce material waste and cycle time, doubling work efficiency;

◆ Easily removable sample rack facilitates quick replacement of test substrates of various materials and shortens batch spraying turnaround time;

◆ The inner chamber walls are coated with non-stick Teflon for effortless cleaning (BGD 227/V only);

◆ Disposable cups hold coating samples for simple, hassle-free operation with no cleaning required and low running costs. (pressure cup feeding mode)



BGD 227/V



BGD 227/O&BGD 227/Ex



Spray gun

Ordering Information→ Technical Parameters ↓		BGD 227/V---Vertical Close-type Automatic Panel Spray Cabinet	BGD 227/O---Vertical Open-type Automatic Panel Spray Cabinet
Max. Effective Test Panels per Single Spraying		12 pcs panels with 150 mm × 75 mm	
Max. Effective Spraying Area	Transverse	300mm	450mm
	Longitudinal	450mm	350mm
Moving Speed of Spray Gun	Longitudinal	0–1000 mm/s	0–500 mm/s
	Longitudinal	0–200 mm/s	0–200 mm/s
Moving Distance of Spray Gun	Longitudinal	Max. 400mm	Max. 550mm
	Longitudinal	Max. 450mm	Max. 350mm
Panel Holder	Magnetic	Transverse × Longitudinal (4 × 3), total 12 magnets	
	Vacuum	Transverse × Longitudinal (2 × 4), 8 suction holes	---
Direction of Panel Holder		Transverse, Longitudinal (Automatic switching)	
Adjustable Spray Distance		100 mm–300 mm (auto–adjust)	100 mm–250 mm (auto–adjust)
Optional Feeding Mode (Select one prior to order)		Syringe feeding / Pressure cup feeding / Gravity feeding / Siphon feeding	Gear pump feeding / Pressure cup feeding / Gravity feeding
Adjustable Feeding Amount		1–300mL/min (200ml Syringe) ; 0–0.7 MPa (Pressure cup)	1–300mL/min (Gear pump/Std.) ; 0–0.7 MPa (Pressure cup)
Adjustable Air Press.		0.6MPa~0.7 Mpa	
Typical Spray Air Consumption		18m^3/h	
Exhaust Pipe Diameter		150 mm	----
Standard Spray Gun		Auto Spray Gun (GRACO)	
Power Supply		220V, 50Hz/60Hz, 7A	
Total Machine Power		1.5 kW	
Overall Size (L × W × H)		985mm × 1040mm × 1840mm	1260mm × 960mm × 1100mm
Daily Consumption (Only for BGD 227/V)		① Paint mist filter felt (aluminum frame, 864 × 640 × 46 mm) ② Primary efficiency filter screen (aluminum frame, 864 × 640 × 25 mm) ③ Primary efficiency filter cotton (aluminum frame, 670 × 180 × 10 mm) ④ Self–adhesive PE film	

Note: Explosion–proof device can be optionally equipped.



Dual Exhaust Filter Assembly



Vacuum Panel Holder



Magnetic Panel Holder

List of Optional Feeding Modes and Corresponding Features

Feeding→ Features ↓	Syringe Feeding	Pressure Cup Feeding	Gravity Feeding	Siphon Feeding
Principle	The servo injection pump delivers sample in metered quantities with precise and controllable flow. Material is discharged by forced pressure, free from the constraints of gravity and negative pressure.	An independent sealed pressure tank feeds stabilized air pressure to extrude sample, which is delivered to the spray gun through pipelines over long distances. It features a wide adjustable discharge range and stable pressure output.	The paint cup is mounted on top of the spray gun. Sample flows down to the nozzle by its own weight, assisted by negative pressure generated at the nozzle for material feeding.	A paint pot is installed underneath the spray gun. High–speed airflow creates negative pressure at the front of the nozzle; this negative suction draws sample up from the pot for atomization.
Applications	For requiring extremely precise control of sample thickness	Most versatile for general use, especially high–viscosity samples	Medium and low–viscosity samples	Medium and low–viscosity samples
Advantages	Can regulate spraying flow and ensure consistent sample thickness in every spraying cycle	Easy to clean; compatible with high–viscosity samples	High utilization with minimal residual sample, fast color change and cleaning; convenient for refilling sample, easy to clean, and can be fitted as an optional accessory with other feeding systems	Low overall cost and cheap consumables; large single filling capacity, compatible with dual spray gun installation
Disadvantages	High operating cost; not suitable for large–area, long–duration continuous batch spraying	Unable to control spraying flow rate	Can't spray high–viscosity samples, and the spraying flow rate is difficult to measure accurately.	Specific spray guns such as Anest Iwata W101 are required; spray width generally needs manual adjustment, low sample utilization rate, incompatible with high–viscosity samples, and the spraying flow cannot be accurately measured
Consumables Required	00 mL syringes (for water–based samples) or 60 mL plunger–free syringes (for solvent–based samples); approx. 0.3 m paint tubing with 6 mm outer diameter and 4 mm inner diameter	200 mL disposable cups; quick–change fluororubber sealing rings; ϕ76 chuck 91; approx. 0.3 m paint tubing with 6 mm outer diameter and 4 mm inner diameter	No consumables required	200 mL disposable cups

Horizontal Automatic Panel Spray Cabinet

Laboratory needs to prepare a huge number of uniform coating test panels during the coating performance testing, and the coating results of traditional manual spraying mainly depends on the operator's experience and skills. So it is not only difficult to ensure the uniformity of the coating (especially when spraying a large area of tested panel), but also it have a certain risk to harm operator's health and environment because of improper spraying operation. In view of this situation, Biuged developed a **Horizontal Automatic Panel Spray Cabinet** equipped with semi-automatic spray gun. The workshop is designed with a water tank (water curtain can be customized), which is easy to operate and efficient. When spraying horizontally, the paint mist is downward and absorbed by the water tank, so that the diffusion is less.

Features:

◆ With dual spray gun, powerful function. The closed spraying operation can ensure that the spraying processes will not pollute the external environment.

◆ Equipped with a water tank and water curtain system in the cabinet, it can absorb most of the spray paint mist. Less gas emission and reduce the pressure of gas discharge in the laboratory.

◆ User can edit spraying methods, such as “Z”, straight line, point type and arc type, which can adapt to different shapes of test panel or workpiece.

◆ Semi-automatic spray gun design is economical and practical.

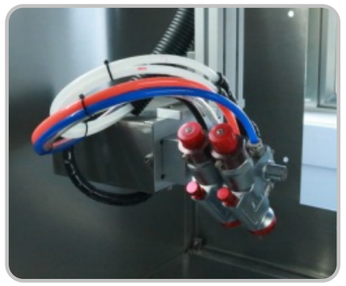
◆ With 10-inch touch screen, user can edit spraying programs clearly. Simple operation, easy to learn and use.

◆ The sample tray can be set at any rotation angle, which has the function of automatic feeding and positioning. And the spray gun can rotate within ±50 degrees, which greatly improves the flexibility of spraying.

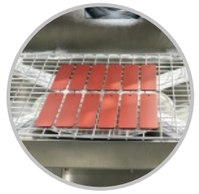
Main Technical Parameters:

★ Max. Spraying Area: 620mm × 720mm, sample tray can rotate 360 degrees;
★ Gun Moving Speed: 0–500mm/s;
★ Spraying Distance: 95mm–215mm (can be adjusted)
★ Rotation Angle of Spray Gun: ±50°
★ Spray Gun: 2pcs, semi–automatic Gravity–type
★ Overall Size: 1260mm × 1300mm × 1860mm (W × D × H)
★ Air Outlet Pipe Diameter: 200mm (also can be customized)
★ Power Supply: 220V; 50 Hz
★ Total Power: 1.5 kW;
★ Net Weight: 220 kg
★ Main Cabinet Material: simple welding with 304# stainless steel, glass door in front, totally enclosed.
★ **Ordering Information:**
BGD 227/H–––Horizontal Automatic Panel Spray Cabinet





Spray gun



Automatic Spray Specimens Preparation Workstation

BGD 370 Automatic Spray Specimens Preparation Workstation is a fully automatic spraying sepecimens preparation workstation integrating automatic panel taking, automatic spraying and automatic drying. This workstation adopts cooperative robot, with spraying and drying functions, and can automatically and quickly prepare standard size sepecimens for testing. It has the following features:

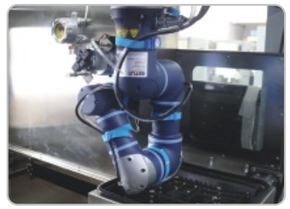
- ◆ Portable robot hand with high degree of automation, integrating automatic panel taking, automatic spraying and automatic drying.
- ◆ With cyclic water curtain and dry filter, both dry fog and wet fog could be disposed simultaneously
- ◆ Equipped with Graco spray guns + PLC, control spraying parameters and path automatically.
- ◆ With a quick-change mechanism for changing different spray guns.
- ◆ Use sample shelf to load or unload sample panels. different sample shelf can be customized according to different sample panels
- ◆ Coatings and solvents are fed using pressure feeding devices, with automatic color change valve switching devices installed, enabling automatic switching after spraying to achieve dual-layer coating and automatic cleaning functions.
- ◆ Equipped with a gear pump for feeding, accurately controlling the flow rate of the sprayed sample, calculating and displaying the wet film thickness, allowing the desired coating wet film thickness to be obtained without repeated adjustment.
- ◆ Intelligent automatic cleaning mode: blowing paint through pipes - solvent cleaning - drying pipes, saving cleaning solvents, and equipped with a waste tank for collecting cleaning waste.
- ◆ Equipped with a baking chamber, with a maximum baking temperature of up to 150℃, allowing the trial board to automatically undergo the baking process after spraying.
- ◆ Equipped with an active exhaust filtering function, with the water curtain using a submersible pump for water circulation.

Main Technical Parameters:
★ Standard Size of Test Panels: 150mm × 70mm
★ Maximum Number of Spray Test Panels: 48 pcs (or 8 layers sample shelves)
★ Spray Speed: 0–500mm/s (Adjustable)
★ Sample Shelf Size: 350mm × 230mm
★ Load of Robot Arm: 3kg
★ Capacity of Cleaning Solvent: 5L
★ Total Time for Spraying a Sample Shelf: 3min (spray two times for each panel, including load and upload panels)
★ Solvent Consumption for Cleaning a Typical Spray Gun: 2L (Approx.)
★ Pressure of Compressed Air: 0.4MPa ~ 0.7MPa
★ Exhaust Pipe Diameter: 250mm
★ Dimension: 1430mm × 1430mm × 2080mm (L × W × H)
★ **Ordering information:**
BGD 370–––Automatic Spray Specimens Preparation Workstation

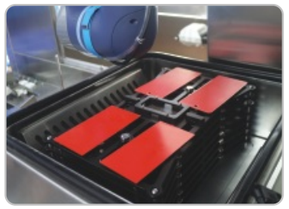




spray gun



robot hand



baking chamber

Perme Cup （Water Vapor permeability ）

Perme cups are used to determine the permeability of films to the vapor of water and other liquids. Materials that are tested include paint, varnish, thin plastic films and other types of sheets thin enough to be tightly sealed in place across the face of the cup. Permeability is expressed as the weight of a vaporous material that passes through a specified area and thickness of free film within a specified time interval under controlled conditions.

These Perme Cup is made up of three basic parts, each machined from the highest grade anodized aluminum. The cup top surface, as well as both surfaces of the clamp ring are smoothly finished to provide a tight seal against the product under test. Two gaskets with the same dimensions as the clamp ring, except for thickness, are furnished for use with rough or uneven materials to insure complete sealing. Extending upward from the face of the cup are two stainless steel pins which closely engage the clamp ring, and any gaskets used, to prevent movement with respect to the test material as the cap is tightened against the cup. The cap design permits use of longer pins than possible with earlier models to accommodate thicker sample and gasket combinations.

Perme Cup is designed to be in complete compliance with ISO 7783 and ASTM D1653.

Ordering Information:

BGD 340/1–––Perme Cup (10cm^2)

BGD 340/2–––Perme Cup (25cm^2)



Digital Anti-static Resistance Ohmmeter

BGD 967 Digital Anti-static Resistance Ohmmeter is used to produce anti-static materials, test anti-static and construct and check of anti-static task. It can convert the measuring scope automatically.

- ◆ High precision
- ◆ High resolution
- ◆ Rapid testing speed
- ◆ Good reading stability
- ◆ Large scope of constant output voltage
- ◆ Large power of output voltage and large short-circuit current
- ◆ Small size for portable
- ◆ Operation by one key.

Main Technical Parameters:	
★ Rated voltage: 100V，500V	
★ Measuring Scope: 0–20000MΩ	
★ Resolution: 10KΩ	
★ Standard Configuration:	
BGD 967 Meter	1 pc
Standard electrode	1 pair
1.8Ah Nickel metal hydride batteries	8 pcs
Charger	1 pc
Case	1 pc
★ **Ordering Information:**	
BGD 967––– Digital Anti–static Resistance Ohmmeter	





Film Physical Performance

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 specula reflection determines the surface gloss level. The intensity of the specula 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 specula 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.

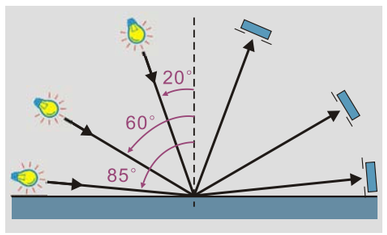
For some specific industrial applications such as the measurement of ceramics, plastics and paper, special 45° or geometries 75° are also available.

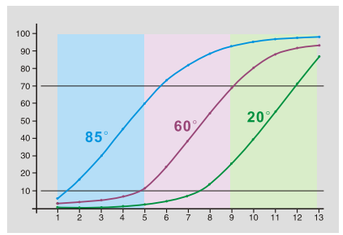
All of Biuged glossmeters can meet globle standard requirements:

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









① Basic Glossmeter

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.

Features:

- Conform ISO 2813, ASTM D 523, ASTM D 2457 etc.
- Cost-effective, easy operation, small size, stable performance and high precision
- 2.3-inch monochrome display
- Supports three language options: Simplified Chinese, Traditional Chinese and English
- Two measurement modes available: Basic Mode and Statistics Mode
- For BGD 519/3, three angle（20°/60°/85°）can test simultaneously
- Data storage function, max. is 35,000 groups
- Come with QC software, can inquire and store testing data, or print quality report
- Calibrate automatically when turn on
- Built-in lithium ion rechargeable battery
- USB/Bluetooth interface, can select mini-printer to print testing data
- Auto power-off
- BGD 519/S Curve Glossmeter is specially used for curve or small area samples





Ordering Information→ Technical Parameters ↓	BGD 519/1 Glossmeter（60°）	BGD 519/S Curve Glossmeter（60°）	BGD 519/3 Tri-Glossmeter（20°,60°,85°）
Measuring Range	0 ~ 1,000 GU	0 ~ 1,000 GU	20°：0 ~ 2,000 GU 60°：0 ~ 1,000 GU 85°：0 ~ 160 GU
Measuring Aperture,mm	9×15	2×4	20°：9×10 60°：9×15 85°：5×38
Resolution, GU	0.1		
Repeatability, GU	±0.2 GU（0~100GU）；±0.2% GU（100GU~2,000GU）		
Reproducibility, GU	±0.5%		
Accuracy, GU	±1.5		
Response Time, s	0.5 s		
Overall Size (L×W×H) , mm	150×50×70		
Net Weight, g	370		
Power Supply	3,200 mAh lithium battery, up to 80 hours of continuous operation when fully charged (tested over 64,000 times)		
Come With	Charger, USB cable, User Manual, Calibration Plate（built-in glossmeter） Software (download from website or provided by after-sales service)		

② Intelligent Touch-screen Glossmeter（New）

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 D523, ASTM D2457, 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 interface, charging and data transmission are integrated, without any software installation. The measurement data is stored in EXCEL form, and users can transfer it to the computer or mobile phone at any time. Simple operation, convenient and fast.

◆ With data storage and querying functions: SSuper 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 automatcially, 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°）

◆ Come with calibration certificate.

◆ After service: One year warranty and lifelong maintenance.

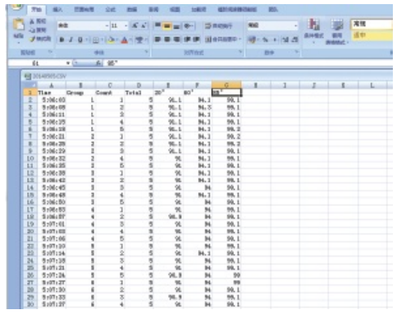
◆ Low power consumption design, can use it for 10 hours when full power and 100% screen luminance, 12 hours when 50% screen luminance.

Main Technical Parameters:
★ Measuring Range: 0.0 ~ 2,000 Gu（20°）; 0.0 ~ 1,000 Gu（60°）; 0.0 ~ 160 Gu（85°）
★ Accuracy: ≤ ± 1.5 GU
★ Zero Error: ≤ ± 0.1 GU
★ Resolution: 0.1 GU（＜120 GU）or 1GU（≥120 GU）
★ Stability: ≤0.2 GU/30min
★ Power Supply: In-built chargeable 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°）

Multilingual:
English, Arabic,
Portuguese, Spanish,
Russian, French



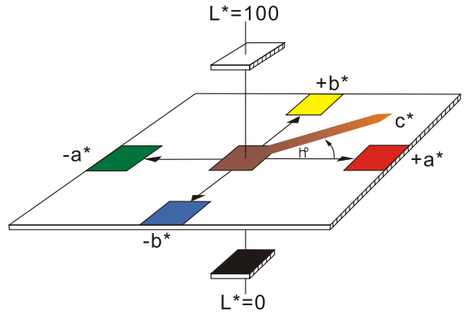


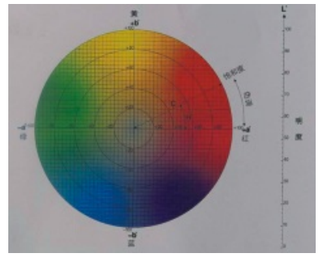


COLOR

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.





How to Choose Your Color Measurement Instrument?

Application Scenario	Recommended Products
Quality Control & Inspection （Focus on color difference between samples and standard color）	BGD 552 Spectral Colorimeter (Color Difference Meter)
General R&D Use (Various common materials)	BGD 558/1 & BGD 558/2 Spectrophotometers (d/8°)
Materials with Good Scattering Properties (e.g., paper prints, architectural coatings, solid industrial coatings, automotive interior materials)	BGD 557 Spectrophotometer (45°/0°)
Coatings Containing Fluorescent Substances	BGD 558/3 Spectrophotometer (d/8°, with UV light source)
Special-Effect Colors (e.g., metallic paints, pearlescent pigments)	BGD 559 Multi-Angle Spectrophotometer
High-Precision Color Measurement (Requires △E*ab repeatability ≤ 0.015)	BGD 554 Benchtop Spectrophotometer
Powder Samples	Optional Powder Test Kit or Universal Test Accessory
Liquids, Gels, or Semi-Fluids	BGD 553 Benchtop Liquid Chroma Meter or Universal Test Accessory
Small or Curved Surface Samples	Color Difference Meter or Spectrophotometer with 4mm Measurement Aperture











① Spectral Colorimeter (Color Difference Meter)

The BGD 552 Series Spectral Colorimeter is the latest generation of high-precision colorimeter developed by Biuged. It adopts a dual-optical-path design, which monitors light source energy fluctuations while measuring sample signals, reducing interference and achieving higher measurement stability. The repeatability index is improved to △E*ab ≤ 0.03, ensuring high standards in measurement speed, accuracy, stability, and inter-instrument consistency.

Additionally, this instrument utilizes an innovative nano-integrated optical component with a thickness of only 5 micrometers as the spectroscopic device, achieving nanometer-level spectral resolution, significantly enhancing color measurement precision.

Features:

◆ **Ultra-High Repeatability (△E*ab ≤ 0.03) & Outstanding Inter-Instrument Consistency (△E*ab ≤ 0.3) Certified Grade 1 Metrology**

Repeatability is a critical performance indicator for color difference meters. The BGD 552 employs an advanced optoelectronic testing system and undergoes rigorous calibration to achieve unmatched repeatability. Furthermore, it uses BCRA standard ceramic tiles for color calibration and traceability, combined with superior craftsmanship, ensuring exceptional inter-instrument consistency.

◆ **Powerful & Convenient Calibration Function**

The BGD 552 requires no frequent manual calibration. Simply place it on the calibration base, and the instrument will automatically adjust based on environmental conditions, ensuring optimal performance at all times.

The calibration base features a zirconia (ZrO_2) white tile (Mohs hardness 9, comparable to diamond), which is highly resistant to scratches and unaffected by temperature/humidity changes. Compared to competitors using standard ceramic or plastic tiles, this ensures superior long-term stability and durability.

◆ **Multiple Measurement Parameters Meeting Diverse Industry Standards**

40+ light sources (A, B, C, D50, D55, D65, etc.)

30+ measurement indices, including: Spectral reflectance, CIE-Lab, CIE-LCh, △E*ab, Hiding power, whiteness, yellowness, etc.

◆ **Versatile Measurement Adaptability**

The BGD 552/2 supports 6 measurement apertures for different sample sizes:

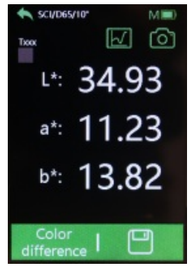
Stable Type: Φ11mm + Φ6mm + Φ3mm

Dexterous Type: ▽11mm + ▽6mm + ▽3mm

◆ **Built-in HD Camera for Precise Positioning (BGD 552/2 Only)**

The BGD 552/2 features a high-definition camera to visually confirm the measurement area, preventing errors caused by misalignment.







BGD 552/2 supports 6 measurement apertures for different sample sizes

Technical Parameters	Ordering Information	
	BGD 552/1 Basic Spectral Colorimeter	BGD 552/2 Premium Spectral Colorimeter
Standards	CIE No.15, ISO7724-1, ASTM E1164, DIN5033-7 etc.	
Illuminating/Viewing Geometry	8° /d	
Integrating Sphere Dia.	40mm	
Measurement Targets	Spectral Reflectance, CIE-Lab, CIE-LCh, HunterLab, CIE-Luv, XYZ, Yxy, RGB, Color Difference (△E*ab, △E*cmc, △E*94, △E*00), Whiteness Index/WI (ASTM E313-00, ASTM E313-73, CIE/ISO, AATCC, Hunter, Taube Berger Stensby), Yellowness Index/YI (ASTM D1925, ASTM E313-00, ASTM E313-73), Blackness/My&dM, Staining Fastness, Color Change Fastness, Tint (ASTM E313-00), Color Density CMYK (A,T,E,M), Metamerism Index (Milm), Munsell Color System, Hiding Power, Color Strength (Coloring Power)	
Illumination	A, B, C, D50, D55, D65, D75, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, CWF, U30, U35, DLF, NBF, TI83, TI84, Id50, Id65, LED-B1, LED-B2, LED-B3, LED-B4, LED-B5, LED-BH1, LED-RGB1, LED-V1, LED-V2	
Light Source	LED+UV	
Observer	2° ,10°	
Disaply Screen	3.5"colorful touch screen	
Spectroscopic Method/Sensor	Nano-integrated spectroscopic device / Silicon photodiode array, dual 16-channel	
Wavelength Range/Interval	400nm ~ 700nm (user can view reflectance at 31 wavelengths) / 10nm	
Measuring Aperture	Φ11mm	Three types: Φ11mm, Φ6mm, Φ3mm (Available in both rounded-stable type and pointed-dexterous type for user selection)
Measurement Mode	SCI	SCI & SCE
Positioning with Camera	×	√
Light Source Lifetime	10 years or one million times	
Reflectance Range/Resolution	0~200% / 0.01%	
Software	Andriod, iOS, Windows, App	
Measurement Mode/ Measurement Time	Single measurement, Average Measurement (2~99 times) / Approx. 1 second	
Display Resolution	0.01	
Data Storage Capacity	Onboard Memory: 10,000 measurement records; APP Support: Cloud-based unlimited storage	
Net Weight/Package Weight	0.6 kg / 2.2 kg	
Power Supply	Rechargeable lithium-ion battery, 3.7V/3000mAh, Single charge enables up to 8,000 consecutive measurements.	
Language	English/Chinese	
Data Interface	USB, Bluetooth	
Optional Accessories	BGD 1390---Special test box for powder BGD 1391/A---Universal Test Components BGD 1393/A---Mini Printer	



BGD 1390
Special test box for powder



BGD 1393/A
Mini Printer



BGD 1391/A
Universal Test Components

② Spectrophotometer

BGD 557&558 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.

Key Characters:

- ◆ Aesthetic design perfectly combined with ergonomics structure.
- ◆ Applied combined LED light source with high life and low power consumption.
- ◆ Φ8mm 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.



BGD 557



BGD 558



Main Menu



BGD 1390
Special test box for powder



BGD 1393
Micro Printer



BGD 1395
Universal Test Components

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, Yxy, LCh, CIE LUV, Hunter LAB (Only for BGD 558)		
Color difference Formula	ΔE^*_{ab}, ΔE^*_{uv}, ΔE^*_{94}, $\Delta E^*_{cmc(2:1)}$, $\Delta E^*_{cmc(1:1)}$, ΔE^*_{00}, ΔE (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 △E*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 △E*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 △E*ab 0.2 (Average value of 12 pcs BCRA II series color tiles)	MAV/SCI, within △E*ab 0.2 (Average value of 12 pcs BCRA II series color tiles)	MAV/SCI, within △E*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		

③ Multi-Angle Spectrophotometer

Introduction: **BGD 559 Multi-Angle Spectrophotometer** provides accurate and consistent color measurement for metalllics, pearlescents and other complex special effect finished products. It adopts industrial-grade MCU and is equipped with 3 or 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.

Features

◆ Multi-angle measurement: Adopt 3 or 5 illumination sources, 1 receivers to measure multi 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.

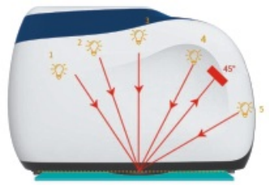
◆ Multiple color measurement space, multiple observation light sources, which can meet the special measurement demand under different measurement conditions.

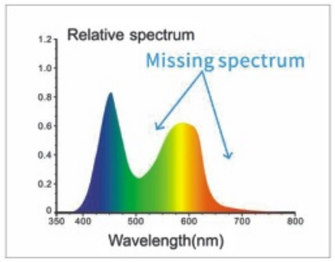
◆ Easily analyze data: The screen can intuitively display spectrum/data, sample chromaticity value, color difference value/figure, pass/fail results, color simulation, sample effect value, effect difference value and other data, convenient to view while also greatly improve the user's work efficiency.

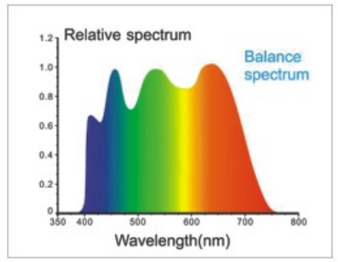
◆ Conform to standards: ASTM D2244, E308, E1164, E2194, E2539; DIN 5033, 5036, 6174, 6175-1, 6175-2; ISO 7724, 11664-4; SAE J 1545











Main 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: Φ12mm

★ Color Space: CIE LAB, XYZ, Yxy, LCh, β xy, DIN Lab99

★ Color Difference Formula: △E*ab, △E*94, △E*cmc (2:1), △E*cmc(1:1), △E*00, DIN△E99, △E 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 Angles Spectrophotometer (15° /25° /45° /75° /110°)



Color data



Color difference value



Color difference graph



Samples Chromaticity values

④ Benchtop Spectrophotometer

Description: For applications requiring extremely high precision in color control, benchtop spectrophotometers offer significant advantages. Compared to portable spectrophotometers, benchtop models feature a more stable optical structure, enabling the detection of very subtle color differences (e.g., ΔE < 0.015). Additionally, inter-instrument variation (ΔE*ab) can be controlled within 0.15, making them ideal for demanding scenarios such as scientific research and quality inspection.

Key Features:

◆ Adopts the internationally recognized D/8 structure, compatible with SCI/SCE measurement, and supports simultaneous fast measurement of SCI+SCE.

◆ Equipped with a 7-inch standalone rotatable tablet (Android), offering fast response and convenient operation.

◆Dual-array CMOS image sensor with high sensitivity and a broad spectral response range, enabling high-precision and highly repeatable measurements.

◆Provides 40+ measurement indices and 41 light sources, including D65, A, C, D50, D55, D75, F1-F12, CWF, DLF, TL83, TL84, TPL5, U30B, U35, NBF, ID50, ID65, LED-B1-B5, LED-BH1, LED-RGB1, LED-V1/V2, LED-C2/C3/C5, and customizable sources (some via PC software), meeting specialized measurement needs under various conditions.

◆Utilizes composite full-spectrum LED light sources (360nm~780nm), including UV, 400nm cut-off, 420nm cut-off, and 460nm cut-off options.

◆Automatic aperture recognition: Supports Φ25.4mm, Φ15mm, Φ8mm, and Φ4mm measurement apertures, allowing flexible configuration of aperture and lens position to accommodate special measurement requirements.

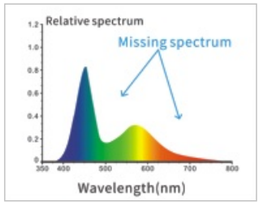
◆ Multi-directional measurement capability: Side, upward, and downward (with accessories) measurement options; open transmission compartment (supports samples up to 54mm thick) for broader sample compatibility.

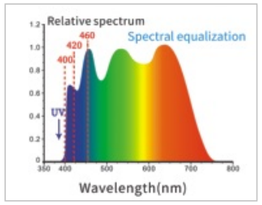
◆Built-in camera for framing and positioning: Real-time camera view ensures precise alignment of the measurement target, improving efficiency and accuracy.

◆ Includes SQCX quality management software, suitable for quality control and color data management across industries. Digitizes color management, compares color differences, generates test reports, provides multiple color space data, and customizes color workflows.

◆ Automatic temperature and humidity compensation ensures more accurate measurement results.









Easy to operate with big display Pad, measurement is faster and more accurate



SQCX Color Quality Management Software

Ordering Information → Technical Parameters ↓	BGD 554/1 Basic Benchtop Spectrophotometer	BGD 554/2 Premium Benchtop Spectrophotometer
Illumination Method	Reflection: D/8 (diffuse illumination, 8° receiving angle) Transmission: D/0 (diffuse illumination, 0° receiving angle) Supports SCI/SCE measurement, UV inclusion/exclusion measurement, and haze (ASTM D1003) Complies with CIE No.15, GB/T 3978, GB 2893, GB/T 18833, ISO 7724/1, ASTM E1164, DIN 5033 Teil 7, JIS Z8722 Condition C	
Integrating Sphere Size	Φ154mm	
Light Source	360nm~780nm composite LED light source, including UV, 400nm cut-off, 420nm cut-off, and 460nm cut-off options	
Spectroscopic Method	Concave grating	
Sensor	256-pixel dual-array CMOS image sensor	
Measurement Wavelength Range	360nm~780nm	
Wavelength Interval	10nm	
Bandwidth (FWHM)	5nm	
Reflectance Measurement Range	0~200%	
Reflectance Resolution	0.01	
Measurement Apertures	Reflection: XLAV Φ25.4mm/Φ30mm, LAV Φ15mm/Φ18mm, MAV Φ8mm/Φ10mm, SAV Φ4mm/Φ6mm; Transmission: Φ25.4mm (no height/thickness restriction, max. thickness ≤54mm); Note: 1-Automatic aperture switching & recognition 2-Users can configure aperture and lens position as needed	
Measurement Modes	Reflection (SCI/SCE), Transmission (SCI/SCE)	
Color Spaces	CIE LAB、XYZ、Yxy、LCh、CIE LUV、Musell、s-RGB、HunterLab、βxy、DIN Lab99	
Color Difference Formulas	△E*ab、△E*uv、△E*94、△E*cmc (2:1)、△E*cmc (1:1)、△E*00、 DIN△E99、△E (Hunter), △E*CH, 555Hue Classification	
Other Chromatic Indices	Whiteness (WI): ASTM E313, CIE/ISO, AATCC, Hunter, Taube, Berger Stensby; Yellowness (YI): ASTM D1925, ASTM 313; ISO Brightness, R457, Metamerism Index (Mt), Color Fastness, Staining Fastness, Strength, Opacity, APHA/Hazen/Pt-Co (Platinum-Cobalt Index), Gardner Index, Haze Transmittance (ASTM D1003), Saybolt Index, ASTM D1500 Color Scale, 8° Gloss, 555 Hue Classification, Blackness (My, dM), Color Density (CMYK – A/T/E/M), Tint, Spectral Density (some functions require PC software)	
Observer Angle	2° /10°	
Light Sources	D65, A, C, D50, D55, D75, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, CWF, DLF, TI83, TI84, TPL5, U30, B, U35, NBF, Id50, Id65, LED-B1, LED-B2, LED-B3, LED-B4, LED-B5, LED-BH1, LED-RGB1, LED-V1, LED-V2, LED-C2, LED-C3, LED-C5 and customizable sources (41 total, some via PC software)	
Display	Spectrum graph/data, sample chromaticity values, color difference/graph, chromaticity diagram, color simulation, pass/fail results, color deviation, color evaluation, haze, liquid chromaticity	
Measurement Time	Approx. 2.0s (approx.4s for simultaneous SCI/SCE measurement)	
Repeatability	Reflection Chromaticity (Φ25.4mm/SCI): △E*ab ≤ 0.015 (avg. standard deviation of 30 white tile measurements at 5s intervals after warm-up & calibration) Spectral Reflectance/Transmittance:≤0.1%	Reflection Chromaticity (Φ25.4mm/SCI): △E*ab ≤ 0.014 (avg. standard deviation of 30 white tile measurements at 5s intervals after warm-up & calibration) Spectral Reflectance/Transmittance:≤ 0.1%
Inter-Instrument Agreement	Φ25.4mm/SCI: △E*ab ≤ 0.15 (avg. of BCRA Series II 12-color tile measurements)	Φ25.4mm/SCI: △E*ab ≤ 0.14 (avg. of BCRA Series II 12-color tile measurements)
Size	440mm×248mm×283mm (L×W×H)	
Weight	Approx. 13.5 kg	
Power Supply	24V DC, 3A adapter	
Light Source Lifetime	5 years (over 3 million measurements)	
Display	7" standalone rotatable tablet, 32GB storage	
Interface	USB, Bluetooth® 5.0, printer serial port	
Data Storage	32GB, supports >100,000 records (SCI/SCE counted as one record)	
Languages	Simplified Chinese, Traditional Chinese, English (customizable: German, French, Spanish, Russian, Japanese, Thai, Korean, Polish, Portuguese)	
Standard Accessories	Power adapter, user manual, quality management software (USB drive), data cable, calibration tiles, black calibration box, transmission black baffle, sample holder, 25.4/15/8/4mm apertures, transmission fixture set, cuvette, 10.5" tablet	
Optional Accessories	Mini printer, inverted stand, Petri dish, micro-well (4mm) transmission fixture set, film holder	

⑤ Haze Meter / Color Haze Meter

Haze refers to the ratio of scattered light flux deviating from the incident light direction to the total luminous transmitted light flux through a sample, expressed as a percentage (%). It measures the degree to which light is scattered due to internal or surface irregularities in a material, resulting in a "cloudy" or "milky" appearance.

For transparent or semi-transparent materials (e.g., Clear coatings), the haze value directly reflects the extent of light scattering caused by internal or surface defects (such as particles, micro-cracks, or unevenness). This helps engineers diagnose formulation or production issues (e.g., poor additive dispersion).

BGD offers two types of haze meters: **Basic Haze Meter-** Measures haze value and luminous transmittance only. **Color Haze Meter-** Combines haze measurement with spectrophotometric color analysis (measuring Lab, yellowness, whiteness, Gardner index, Pt-Co color, and dozens of other color parameters).

Both types are widely used for haze and luminous transmittance testing in industries such as coatings, glass, plastics, films, displays, and packaging.

Standards

ASTM D1003 *Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics*

ISO 13468 *Determination of the Total Luminous Transmittance of Transparent Materials-Part 2: Double-Beam Instrument*

ISO 14782 *Plastics-Determination of Haze for Transparent Materials*

Features

- 7-inch color touchscreen + Android OS for intuitive operation
- Dual-beam technology minimizes light source fluctuations, ensuring high precision and stability
- Compensation method for more accurate transmittance results
- Horizontal & vertical sample placement for versatile testing
- Open measurement area accommodates samples of any size
- Long-life LED light source (10 + years without replacement)
- Instant measurement—No warm-up needed, results in 1.5 seconds
- PC software included— Advanced data analysis and report generation for haze, color, and transmittance



BGD 550/1 Haze Meter



BGD 550/2 Color Haze Meter



Plastic film



Plastic sheet



Clear varnish coating



Glass panel



LCD screen

Technical Parameters	Ordering Information	
	BGD 550/1 Haze Meter	BGD 550/2 Color Haze Meter
Illuminating/Viewing Geometry	Transmittance: 0° /d (Parallel illumination, diffuse reception)	
Light Source	CIE-A, CIE-C, CIE-D65	**Haze/Transmittance:** CIE-A, CIE-C, CIE-D65 **Color:** A, C, D50, D55, D65, D75, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, CMF, U30, DLF, NBF, TI83, TI84
Measure Targets	Haze and Luminous transmittance under ASTM & ISO standards	HAZE, Luminous Transmittance, Spectral Luminous Transmittance, CIE Lab, Lch, CIE, Luv, XYZ, Yxy, Hunter Lab MunsellMI, CMYK, Whiteness Index/WI (ASTM E313-00, ASTM E313-73, CIE/ISO, Hunter, Taube Berger Stensby), Yellowness Index/YI (ASTM D1925, ASTM E313-00, ASTM E313-73), Tint(ASTM E313-00), Metamerism Index (Milm), APHA, Pt-Co Index, Gardner Index, Color Difference (△E*ab,△E*CH, △E*uv, △E*cmc (2:1), △E*cmc(1:1), △E*94, △E*00)
Measuring Aperture	7mm & 21mm	21mm
Wavelength Range/Interval	---	400nm~700nm (@10nm), LED
Integrating Sphere Dia.	ϕ154mm	
Measurement Range	0-100%	
Measurement Repeatability	Haze repeatability ≤0.05% (Haze < 10%), Haze repeatability ≤0.1% (Haze ≥10%); luminous transmittance repeatability ≤ 0.1%	
Resolution	0.01%	
Sample Requirement	No limitation for sample area, thickness ≤ 145mm	
Data Storage Capacity	Cloud-based unlimited storage	
Interface	USB	USB-A, USB-B
Power Supply	310mm × 215mm × 540mm	598mm × 247mm × 366mm
Overall Size (L××W×H)	DC12	220V (with power source line)
Optional Accessories	Film Holder, Cuvette Holder, Panel Holder, Custom Apertures, Haze Standard Plates, Transmittance Standard Plates, etc.	

⑥ Portable Whiteness Meter

The BGD 586 is the latest portable whiteness meter developed by Biuged. Designed in strict compliance with the standard light source and illumination conditions specified by the CIE (International Commission on Illumination), it undergoes rigorous testing and factory inspection.

The BGD 586 Portable Whiteness Meter primarily measures ISO Brightness (R457 Whiteness, also known as Blue Light Whiteness). It is widely applicable for testing the whiteness of pigments & fillers, paper products, plastics, white cement, ceramics & porcelain, clay, starch, flour, salt, detergents & cosmetics.

Features:

Conforms ISO 105-J02, ISO 2470-2, ISO 2471, ISO 11475, ASTM E313 and DIN 53186 etc.

- Portable design for easy carrying and on-site measurements.
- 2.4-inch full-color touchscreen with clear display and intuitive operation.
- Combined LED light source and dual-channel CMOS spectrophotometric sensor for high-precision testing.
- China's first built-in light source correction system, overcomes the industry limitation of portable whiteness meters being unable to measure fluorescent whiteness, now rivaling benchtop models.
- No zero calibration required, simple and efficient operation.
- Special moisture-proof construction ensures reliable performance in harsh environments.
- Instant measurement, no warm-up time, stable readings with no drift for fast results.

- ◆ Long-life light source (over 3 million measurements in 5 years) with no replacement needed.
- ◆ Nationally calibrated reference whiteboard guarantees traceable and accurate measurements.
- ◆ Optional powder sample kit and press for precise whiteness testing of powdered materials.

Main Technical Parameters：
★ Optical Geometry: 45° /0°
★ Measurement Aperture: Φ 8mm
★ Measurement Range: 0–200.00%
★ Resolution: 0.01%; Repeatability: ≤ 0.1%
★ Zero Drift: ≤0.1%/10min
★ Indication Drift: ≤0.1%/3min
★ Power Supply: Rechargeable lithium battery (supports 8 hours of continuous operation or 5,000 measurements)
★ Dimensions: 150mm × 50mm × 75mm; Net Weight: 300g
★ **Ordering Information:** BGD 586––– Portable Whiteness Meter



⑦ Multifunctional Whiteness Meter

BGD 584 Multi-function Whiteness Meter adopts liquid crystal display, integrates light, mechatronics and micro-computer measurement and control technology, and has the function of test data statistics processing, which can quickly and accurately measure the whiteness (brightness) of various objects. It can be widely used in the determination of whiteness of pigments, fillers or other powders in coatings, as well as in papermaking, textile, printing and dyeing, plastics, ceramics, enamel, grain, building materials and other industries. The instrument can measure not only ISO brightness (R457 whiteness), but also the fluorescent whiteness of fluorescent materials, and also the brightness stimulation value Y10, transparency, opacity, light scattering coefficient and absorption coefficient of coating, paper and other thin page materials.

BGD 584 complies with CIE 15 and CIE S 005 《standard illuminants and geometric conditions》, simulating D65 illuminant lighting, adopting d / 0 lighting observation geometry conditions , diffusion ball diameter isφ150 mm, with two test hole diameter, ϕ30mm and ϕ19mm, equipped with light absorber, eliminating the influence of specular reflection light (SCE). The peak wavelength of spectral power distribution of R457 whiteness optical system is 457 nm, half height and width is 44 nm.

Standards:

ISO 105-J02 *Textiles-Tests for color fastness-Part J02: Instrumental assessment of relative whiteness*

ISO 2470-2: 2008 *Paper, board and pulps - Measurement of diffuse blue reflectance factor - Part 2: Outdoor daylight conditions（D65 brightness）*

ISO 2471: 2008 *Paper and board - Determination of opacity (paper backing) - Diffuse reflectance method*

ISO 11475: *2017* *Paper and board - Determination of CIE whiteness, D65/10 degrees (outdoor daylight)*

ASTM E313 *Standard Practice for Calculating Yellowness and Whiteness Indices from Instrumentally Measured Color Coordinates*

DIN 53186 *Testing of pigments and extenders - Determination of whiteness*

Features:

- ◆ Come with powder sampler for powder measurement
- ◆ Come with thermal printer
- ◆ Can measure continuously sample many times and calculate automatically the arithmetic mean value.
- ◆ With power-off protection, zero adjustment, alignment, standard value and other data, even if the power is lost for a long time, the data will not be lost.

Main Technical Parameters：
★ Measurement Range: 0.0–120.0
★ Zero Drift: ≤0.1 %
★ Indication Drift: ≤0.1 %
★ Indication Error: ≤0.5 %
★ Repeatability: ≤0.1 %
★ Specular Reflectance Error: ≤0.1%
★ Sample Size: test plane≥ ϕ30mm, thickness≤40mm
★ Power Supply: 220V ± 10%, 50Hz, 0.3A
★ Working Condition: temperature 0–40 ℃, relative humidity ＜85%
★ Overall Dimension （L × W × H）: 365mm × 260mm × 425mm
★ Net Weight：About 11kg
★ **Ordering Information:**
BGD 584–––Multi–function Whiteness Meter



Thickness

How to Choose Your DFT（Dry Film Thickness Meter）

Applications	Recommended DFT Types
General measurement of coatings on flat metal substrates or large curved surfaces (radius of curvature: convex >5mm or concave >25mm)	BGD 545 & BGD 546 Coating Thickness Gauges
Precision measurement of ultra–thin coatings (<10 μ m) on metal substrates	BGD 547 Coating Thickness Gauge
Coatings on small–area metal substrates (diameter <7mm)	BGD 547 Coating Thickness Gauge
Coatings on ultra–thin magnetic metal substrates (thickness <0.2mm)	BGD 547 Coating Thickness Gauge
Coatings on small curved surfaces (convex radius <5mm or concave radius <25mm)	BGD 547 Coating Thickness Gauge
Coatings on metal substrates in confined spaces (e.g., pipes or small concave surfaces)	BGD 546 Split–type Coating Thickness Gauge
Non–destructive measurement of coatings on non–metallic substrates (e.g., concrete, glass, wood, plastic)	BGD 549 Ultrasonic Thickness Gauge
Destructive measurement of coatings on non–metallic substrates (e.g., concrete, glass, wood, plastic)	BGD 548 Destructive Thickness Gauge
Free films or peeled coatings	BGD 963 & BGD 964 Thickness Gauges

① Thickness Gauge

These gauges are simple tool used to test the thickness of leather, paper, film, wire and similar products. It can be used widely, dexterous and convenient, high efficiency.



BGD 963



BGD 964

- ◆ **Ordering Information：**

BGD 963/1–––Analog Thickness Gauge (Test range: 0–10mm; Resolution: 0.01mm)
BGD 963/2–––Analog Thickness Gauge (Test range: 0–1mm; Resolution: 0.001mm)
BGD 964/1–––Digital Thickness Gauge (Test range: 0–10mm; Resolution: 0.01mm)
BGD 964/2–––Digital Thickness Gauge (Test range: 0–1mm; Resolution: 0.001mm)

② Wet Film Comb Thickness Gauges

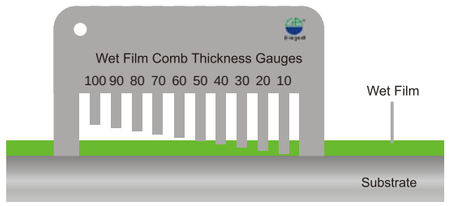
The Wet Film Thickness Gauges are made of a comb-shaped design with precision cut gaps to determine the coating thickness by placing vertically onto a wet coated substrate. it is a corrosion-resistant stainless steel with a hole at the top comer so that a string（not supply）can be attached for hooking.

All Wet Film Thickness Gauges are machined by high precision CNC and with less than 3 micron devitation. They come standard with 10 gaps or more with inscriptions of the thickness at the side of each gap. It is recommended to replace a new gauge if there are chips, crack or uneven at the gap（s）of the gauge.

It comfoms ISO 2808 Method 1A and ASTM D4414.

◆ **Ordering Information：**

BGD 531/1： 10 μm–100 μm（@10 μm）
BGD 531/2： 20 μm–200 μm（@20 μm）
BGD 531/3： 50 μm–750 μm（Two–sided, @25 μm/50 μm）
BGD 531/6： 300 μm–2600 μm（Quadrilateral @25 μm /100 μm）
BGD 531/7： 25 μm–3,000 μm（Hexagon）





③ Rolling Wheel Wet Film Thickness Gauges

The Rolling Wheel Wet Film Thickness Gauge has long been the standard for measuring wet film thickness in the coatings industry. It comfoms ISO 2808 Method 1B and ASTM D1212 Method A.

The gauge consists of an eccentric inner wheel, supported by two large outer concentric wheel. At a specific point, the inner wheel touches and picks up wet film when the gauge is rolled on the coated surface. The critical clearance may be read on a rotating scale.

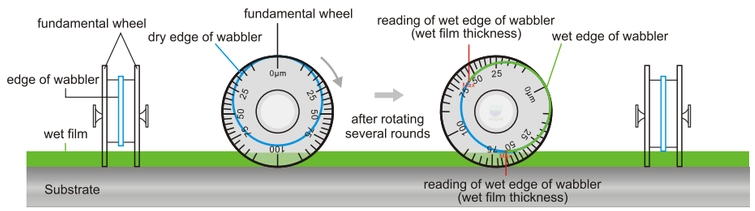
Both the body of the gauge and the centre holder are made of high-grade stainless steel. The scale value are casted on 1 side.

Biuged offer three basic models in various ranges. All models have an accuracy of 2.5 μ m（± 0.0001 in） or 2.5% full scale, whichever is greater.

Main Technical Parameters：
★ Dimensions： 50（Φ）×15（H） mm@2mm path
★ Weight： approx.177g
★ **Ordering Information**：
BGD 532/1 0–100 μ m （@5 μ m）
BGD 532/2 0–200 μ m （@10 μ m）
BGD 532/3 0–500 μ m （@25 μ m）
BGD 532/4 0–1,000 μ m （@50 μ m）







④ Precise Dry Film Thickness Gauge

According to the actual application requirements, Biuged offers three different types of thickness gauges which combine the Hall effect and Eddy current principles to measure the thickness of non-ferromagnetic coatings on ferromagnetic metal substrates (iron, cobalt, nickel and gadolinium) and the thickness of non-conductive coatings on non-magnetic metal substrates (copper, aluminum, magnesium, zinc, chromium, etc). The instrument is widely used in metal processing, coating, hardware, shipbuilding, aerospace and other fields.

◆ Iron and aluminum dual use. Identify substrate automatically, and fast automatic conversion. (BGD 545&BGD 546)
◆ Sensitive response, and the data can be measured in 0.5 seconds.
◆ With simple design and small size, it is easy to carry and operate.
◆ Ruby probe has abrasion and corrosion resistance, which ensures long service life and can avoid errors caused by wear.
◆ Two units of μm/mil can be selected.
◆ The advanced digital probe is used to keep the zero position stable for a long time without drifting. The test data is stable after testing the same position for multiple times.
◆ The thickness gauge adopts unique algorithm to solve the linearity of the instrument and ensure measurement accuracy. It doesn' t need to be calibrated, only need zero adjustment.
◆ The good repeatability to ensure that it passes the inspection of Chinese national metrological testing.
◆ Available in three different modes: Fe mode, NFe mode and Fe/NFe mode (BGD 545&BGD 546)
◆ Conform to standards: ISO 2178, ISO 2360, DIN/EN/ISO 2808, ASTM D1186, ASTM D1400, ASTM D7091, DIN 50981, DIN 50984 etc.
◆ BGD 547 is specially designed for measuring the thickness of ultra-thin coatings or platings below 10μm, and it adopts ultra-thin probe design, which is especially suitable for measuring coatings on small workpieces such as screws and bolts. The probe adopts digital oscillation technology and high-speed ADC acquisition, which ensure that the instrument has ultra-high measurement accuracy and repeatability（When equipped with the probe holder, the maximum measurement repeatability could reache ±0.8% of readings + 0.1μm.）. In addition, BGD 547 also has the function of data statistics, which can store up to 9 measurement values and automatically calculate the maximum, minimum, average and standard deviation of the measured data.



BGD 545


BGD 546



BGD 547

Ordering Information → Technical Parameters ↓	BGD 545	BGD 546	BGD 547
Probe	Integrated probe	External cable probe	
Applicable Substrate	Metal materials		Magnetic metal（Fe） Non–magnetic metal（NFe, Optional）
Measuring Range	0.0–5,000μm		0.0–500μm
Resolution	0.1μm（＜100μm）； 1μm（100μm～999μm）； 10μm（＞1,000μm）		
Accuracy	⩽±（3% reading+2μm）		⩽±（2% reading+0.3μm）
Minimum Curvature	Convex: 5mm / Concave: 25mm		Convex: 1.5mm / Concave: 10mm
Minimum Measuring Area	$6mm^2$		Diameter: 7mm
Minimum Substrate Thickness	Fe: 0.2mm / NFe: 0.05mm		0.1mm（Fe）or 0.03mm（NFe）
Display	128 × 48 dot matrix LCD		240 × 160 dot matrix LCD
Power Supply	2pcs of 1.5V AAA alkaline battery		4pcs of 1.5V AAA alkaline battery
Dimension	101mm × 62mm × 28mm		148mm × 76mm × 26mm
Weight	79 g (with battery)		194 g (with battery)
Optional Accessories	USB online cable and software, Bluetooth adapter and software		BGD 1297––Probe Holder BGD 1186––NFe Probe (0~1.5mm) BGD 1187––NFe Probe (0~2.0mm)

⑤ Ultrasonic Coating Thickness Gauge

For certain non-metallic substrates such as wood, glass, plastic, and concrete, non-destructive measurement of coating thickness, especially in multi-layer coating systems might be particularly challenging. The newly developed BGD 549 Ultrasonic Coating Thickness Gauge by Biuged effectively addresses this issue.

This instrument operates on the ultrasonic principle, where the probe emits high-frequency ultrasonic pulses that travel through a coupling agent (transit time negligible) into the coating. When encountering interfaces between layers of differing densities, part of the ultrasonic wave reflects as a new pulse, while the remainder continues through. The reflected pulse returns to the probe, where it is captured by the built-in ultrasonic sensor. The instrument processes the pulse's travel time within the coating to calculate the corresponding thickness.

Designed and manufactured in compliance with ISO/TS 19397 Determination of Paint Film Thickness-Ultrasonic Thickness Gauge Method, the BGD 549 is not only specialized for measuring coating thickness on plastic, wood, glass, and other non-metallic substrates but also capable of measuring coatings and base material thickness on metal substrates.

Features

- Wide range of applications：capable of measuring coating thickness on nearly all substrates, including steel, aluminum, plastic, glass, concrete and other materials.
- Multi-Layer Measurement: Supports up to 3 layers (coatings or coating + substrate), meeting complex inspection needs.
- High-Speed ADC Technology: 1μm resolution for micron-level precision.
- Industrial-Grade IPS Color Screen, Intuitive menu-driven operation with clear visualization.
- Broad Measurement Range: 13-5500μm (epoxy resin coatings), 300-14800μm (45# steel), 50-8360μm (concrete). Covers ultra-thin to heavy coatings, adapting to multi-material, multi-process scenarios.
- Real-Time Waveform Display.
- Adjustable cursor helps analyze coating structure and verify measurement boundaries for improved accuracy.
- Auto-Gain Switching-- Automatically selects optimal gain based on material type and thickness.
- 3 Sound Velocity Adjustment Modes-- Choose by material, known thickness, or manual input for flexibility.
- Threshold Filtering-- Set upper/lower limits and estimated thickness to eliminate interference echoes.
- 999 Data Storage-- Large capacity for record-keeping and comparative analysis.
- Φ6mm Small Measurement Area-- Ideal for fine structures and localized measurements.
- Other Functions-- Zero calibration, continuous measurement mode, built-in temperature compensation.

Main Technical Parameters：
★ Measurement Range: 13μm ~ 5,500μm (epoxy coatings);
300μm ~ 14,800μm (45# steel), 50–8360μm (concrete)
★ Resolution: 1μm
★ Accuracy: ≤ ± (3%H + 3μm), where H = reference value
★ Sound Velocity Range: 1,000m/s ~ 9,999 m/s (adjustable)
★ Min. Measurement Area: Φ6mm
★ Display: 800 × 480 IPS color screen
★ Units: μm / mil
★ Languages: Simplified Chinese, English
★ Dimensions (Main Unit): 142mm × 91mm × 23mm
★ Probe Dimensions: Φ26mm × 42.1mm
★ Weight: 475g
★ Power Supply: Rechargeable Li–ion battery (3.7V, 4000mAh)
★ Charging Port: USB Type–C
★ Input Voltage: DC 5V
★ Operating Current: 447mA
★ Power Consumption: 1475mW
★ **Ordering Information:** BGD 549–––Ultrasonic Thickness Gauge
(Supplied with probes for wood, plastic and metal substrates as standard)
BGD 1180 –––Probe for concrete substrates





⑥ Paint Inspection Gauge (P.I.G)

BGD 548 is a paint inspection gauge which is suitable for use wherever conventional electro-magnetic measuring techniques are ineffective, namely for coatings on wood, concrete, plastics and other non-metallic substrates.

Testing with the BGD 548 is based on the standardized wedge cut procedure: The coating is cut through at a defined angle in such a way that the cut penetrates the substrate. The layer thickness (s) is calculated on the basis of the slope projection (b) of the cut face, determined using a measuring microscope, and the cutting angle (α), Similarly, the individual layer thickness of multilayer systems can be ascertained.

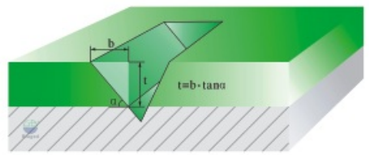
The BGD 548 consists of a black painted aluminium block which accommodates the following functional elements:

- Exchangeable carbide tip with precision-ground angular cutting blade (come with 4 cutters)
  No.1 Cutter: Measuring range: 20-2,800μm（Factor: 20 μm）
  No.2 Cutter: Measuring range: 10-1,400μm（Factor: 10 μm）
  No.3 Cutter: Measuring range: 5-700μm（Factor: 5 μm）
  No.4 Cutter: Measuring range: 2-2,80μm（Factor: 2μm）
- Measuring microscope with a magnification of 30 and a reticle (2.8mm with 1/140 division), which is also suitable for inspection tasks.
- With two wheels design let cutting working is more stable and uniform.
- Battery compartment for 1.5 V battery block.
- Combination of LED and fibre-optic light guide for optimum specimen illumination at low current consumption.

It complies with ASTM D4138, AS 1580 Meth 408.1

Main Technical Parameters：
★ Measuring range (standard)： 2 ~ 2,800μm
★ Power supply： 1 pc 1.5V battery
★ Overall Size： 110mm × 85mm × 25mm
★ Weight： 0.5 kg
★ **Ordering Information:**
BGD 548–––Paint Inspection Gauge
BGD 548/Z–002–––Mobile Phone Observation Holder





Mearsuing Theory



Operators can view Mobile Phone Observation Holder for more intuitive and clear observation, and save high–definition images to the mobile phone.

Film Mechanical Performance

ADHESION

① Cross Hatch Tester

This instrument is widely used to evaluate the adhesion of various coatings .A high precise machined wheel presenting 6 or 11 cutting blades with various spacing is mounted in a handle. The test is carried out by performing 2 series of crossed cuts at right angle. The obtained lattices is either brushed or cleared with adhesion tape. According to the coatings thickness and the related spacing, the results can be classified with reference to a standard scale. It has long life tool with 8 cutting edges and comfortable wood handle.

When applied to multi-coat system, assessment of the resistance to separation of individual layers of the coating from each other may be made.

Furthermore, all Biuged cross hatch testers are designed with turnable cutter holder, which is very convenient to cut coatings on curve or uneven surface and ensure to apply a uniform power to cut through the substrate.

The Cross Hatch Cutters conform with the requirements of:

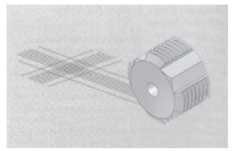
ISO 2409, ISO 16276-2, ASTM D3359, ASTM D3002, BS 3900 E6



BGD 502



The turnable cutter holder is convenient to cut coatings on curve or uneven surface





Main Technical Parameters：		
★ Eight working side blades： When the blade edge is not sharp enough, users can loosen the boat type nut and top thrust screw to rotate it to achieve a new blade.		
★ Multi–cutting blades spacing： 1mm/2mm/3mm		
★ The number of square： 25squares/100squares		
★ Normal Packing List		
① Carrying case	② Cross Hatch Cutter & Handle	
③ 1 roll of 3M Scotch Transparent Tape	④ Brush	⑤ Magnifier
⑥ Calibration Certificate		

Procedure

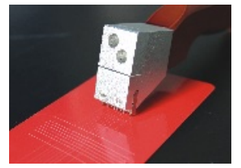
-Make a lattice pattern in the film with the appropriate tool, cutting the substrate

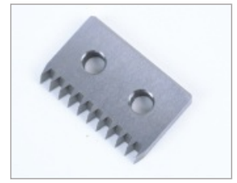
-Brush in diagonal direction 5 times each, using a brush pen or tape over the cut and remove with special tape

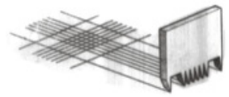
-Examine the grid area using an illuminated magnifier.



BGD 504





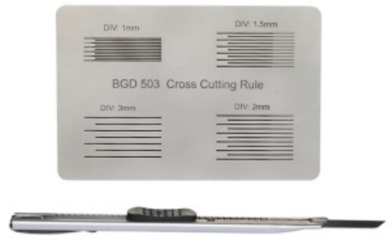


Ordering Information		No. of Teeth	No. of Cutting Edges	Cutter Spacing
For Cross Hatch Testers	For Cutters Only			
BGD 502/2	BGD 502/J–002	11	8	1mm
BGD 502/3	BGD 502/J–003	6	8	1mm
BGD 502/4	BGD 502/J–004	11	8	2mm
BGD 502/5	BGD 502/J–005	6	8	2mm
BGD 502/6	BGD 502/J–006	6	8	3mm
BGD 504/2	BGD 504/J–002	11	1	1mm
BGD 504/3	BGD 504/J–003	6	1	1mm
BGD 504/4	BGD 504/J–004	11	1	2mm
BGD 504/5	BGD 504/J–005	6	1	2mm
BGD 504/6	BGD 504/J–006	6	1	3mm

② Cross Cutting Rule

BGD 503 Cross Cutting Rule is used to test the adhesion of film with substrate（the thickness of dry film less than 250μm）. It confirms to ISO 2409:（2013）and BS 3962-6 Standard.

Main Technical Parameters：
★ Cutting distance： 1mm, 1.5mm, 2mm, 3mm
★ Cutting Length： 35mm
★ Cutting Number： 11 teeth for each
★ Single–blade Cutter： With V shape cutting edge（ 15° ～30° ）, blade thickness 0.43mm ± 0.03mm
★ **Ordering Information**： BGD 503––– Cross Cutting Rule BGD 503/W–001–––Cutter Blade（ pack of 10 ）



③ Automatic Cross Hatch Tester

As an important method to evaluate the adhesion degree between coating and substrate, cross cut method has been widely used. Although the traditional manual cross cut method is simple and convenient, due to the operator's cutting speed and coating cutting force can not be accurately controlled, the test results of different testers are different. The latest ISO 2409-2019 standard clearly defined that in order to obtain uniform and consistent cutting, automatic cross hatch adhesion tester with motor drive shall be used as far as possible.

BGD 535 Automatic Cross Hatch Tester is an auto. cross cut instrument which designed by our company according to the latest ISO 2409 and ASTM D3359 standards. Compared with similar products in the market, it has the following advantages:

◆ Adopts 7-inch industrial grade full touch screen, which can edit relevant cutting parameters and display the parameters clearly and intuitively

◆ Cutting speed, cutting load, cutting intervals and cutting number (landscape cuttings & portrait cuttings) can be set

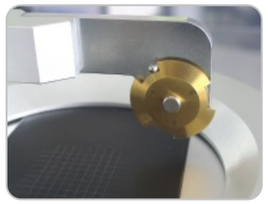
◆ The load force in the cutting process is automatically compensated to ensure constant load and consistent cutting depth of coating

◆ Automatic clamping test sample, simple and convenient.

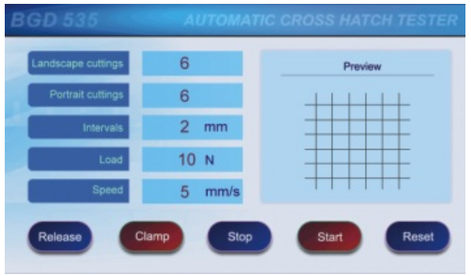
◆ After a certain cutting direction is completed, the working platform automatically and accurately rotates 90 ° to avoid that the cutting lines caused by artificial rotation cannot be completely crossed vertically

◆ A variety of special test tips are available as options (e.g. Clemen scratch tip, Van Loar scratch tip, Bosch scratch tip, BMW scratch tip, scratch tips with Φ1 mm, Φ7 mm diameter or other geometries/angles, etc.), to perform scratch-resistance tests and corrosion-related scratch tests on automotive interior plastic parts in compliance with standards including ISO 1518, ISO 17872, PV 3952, PV 3974, GME 60280 and GMW14688 etc.





Main Technical Parameters：
★ Test Plate Size: 150mm × 100mm × （0.5–20）mm
★ Setting Range of Cutter Load: 2N ~ 50N
★ Cutting Speed Setting Range： 1mm/s ~ 40mm/s
★ The Min. Cutting Interval: 0.5mm
★ The Max. Cutting Interval: 45mm/（Cutting number–1）
★ Setting Range of Cutting Angle： 25° ~90°
★ Power Supply： 220V, 50Hz
★ Max. Power: 80W
★ Instrument Dimension: 540mm × 335mm × 380mm （L × W × H）
★ **Ordering Information:**
BGD 535–––Automatic Cross Hatch Tester
BGD 535/J–020–––Cutter for Automatic Cross Hatch Tester



Note: Bluged also accepts special–instrument orders for larger cutting areas (including cutting length, cutting interval and cutting numbers) or higher cutting speeds.

④ Image Recognizer for Cross-cut

After finishing cross-cut test on the coating film, the operator should judge accurately the flaked area percentage and then make a classification, the traditional method is with his own naked eye. Since it is difficult to accurately quantify the falking area with the naked eye, there are relatively large subjective differences in the results or classfications, and it is easy to dispute. In order to solve this problem and improve the repeatability and reproducibility of the cross-cut test results, Biuged has developed an instrument that can automatically identify the flaking area. This instrument uses computer digital image processing（visual automatic analysis）technology to take photos of the crossed-cut area, and then analyze and calculate the digital images, which can quickly and easily obtain accurate results.

BGD 350 Image Recognizer for Cross-cut is composed of a hand-held cylindrical structure, which can be conveniently placed on the cross-cut area pattern to be evaluated. It is also equipped with a camera and an LED lamp with adjustable illumination intensity.

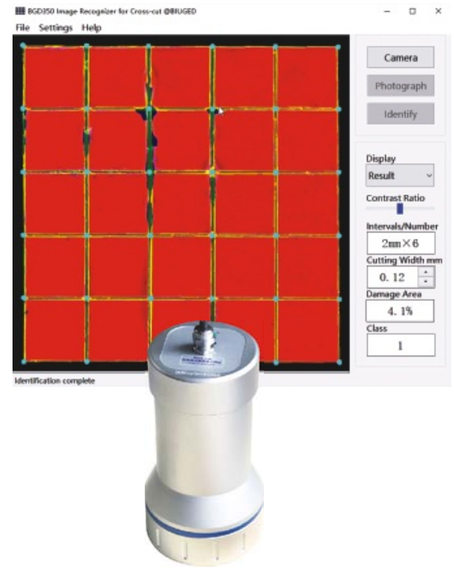
Features:

◆ Different imaging modes are automatically selected by special hardware to optimize the contrast ratio of the surface to be evaluated.

◆ Automatic estimation of cutting quantity, cutting spacing and width of cutting parallels, and manual adjustment to obtain accurate measurement.

◆ Automatically calculate the proportion of flaking area and display the corresponding classfications.

Main Technical Parameters：
★ Maximum Assessable Range： 35mm × 35mm
★ Camera Observation Accuracy： 80px/mm
★ Light Source： Combined LED white light source
★ Language： English/Chinese
★ Operating Temperature and Humidity Requirements： 5℃ ~ 40℃; relative humidity≤80%（at 35℃）, no condensation
★ Port： USB 3.0, 500mA
★ Minimum System Requirement： Windows 10 / Windows 11 64–bit operating system, 4GB RAM
★ Overall Size（Height × Diameter）： 166mm × 90mm
★ Host Weight： About 700g
★ **Ordering Information**：
BGD 350–––Image Recognizer for Cross–cut



3M Scotch Transparent Tape

Used to test the adhesion of film after the film was cut , Its adhesion power is 10±1N/25mm

Ordering Information
★ BGD 1011–––600P Type： Length/32.9m； Width/19 mm
★ BGD 1012–––600 Type： Length/66.0m； Width/19 mm
★ BGD 1013–––600 Type： Length/66.0m； Width/25.4 mm



⑤ Digital Pull off Adhesion Tester（PsiaTester）

In order to perform satisfactorily, coatings must adhere to the substrates on which they are applied. There are three different adhesion test procedures to assess the resistance of paints to separate from the substrate. The cross cut test, also described as cross-hatch, uses a blade to cut through the coating to the substrate. At least two cuts are made that intersect at 90 degrees to get a right angle lattice pattern. The cross-cut area is observed for any adhesion failure. The second method to test the coating adhesion is using a stylus or loop that an increasing amount of weight is applied until the coating is removed from the substrate. The third method called pull-off adhesion, measures the amount of tensile stress to pull the coating off the substrate. A dolly is glued to the coating surface, after the glue is cured, a testing apparatus is attached to the loading fixture and aligned to apply tension perpendicular to the test surface. The force applied is gradually increased and monitored until either a plug of coating material is detached, or a specified value is reached.

BGD 500 Digital Pull-off adhesion Tester is a portable, hand-operated instrument which is used to measure the force required to pull a specified test diameter of coating away from its substrate using hydraulic pressure. The pressure is displayed on a digital LCD and represents the coating's strength of adhesion to the substrate.

It evaluates the adhesion (pull-off strength) of a coating by determining the greatest tensile pull-off force that it can bear before detaching. Breaking points, demonstrated by fractured surfaces, occur along the weakest plane within the system consisting of dolly, adhesive, coating layers and substrate.

BGD 500 Digital Pull-off adhesion Tester conforms to ASTM D4541, ASTM D7234, EN 12004-1, EN 12004-2, EN 13144, ISO 4624, ISO 16276 etc.

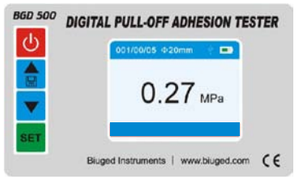


BGD 500





Dolly



Characters

CONVENIENT

- Portable design, can be used anywhere.
- Built-in rechargeable lithium battery, no need any external power source.
- Selectable directly four different sizes dolly for different resolution and testing range
- Get the testing results from LCD directly.
- Includes all tools needed for testing

PRECISE

- Each PsiaTester’s pressure system is calibrated to within 1% accuracy by NIST traceable load cells
- High-precise professional sensor ensures 0.01MPa resolution
- Self-aligning dollies ensure to get a reliable testing results for smooth or uneven surfaces.
- Come with calibration certificate

INTELLIGENT

- Store all test results （includes Max. Pull-off power, pull-off rate, dolly size and time） automatically
- Two units （MPa and psi）for selection and can be converted automatically.

- USB interface as standard, no need any software, PsiaTester is also a U disk, when connecting the computer, operator can read all data directly which is recorded during testing.
- Showing pull-off rate allows users monitor and adjust pull speed according to different test requirements.

DURABLE

- Waterproof, dustproof and shockproof design meets any harshest operating environment
- Strong plastic carrying case
- One year warranty

FOR AUTOMATIC TYPE

- Originated in China, it can test automatically adhesion between coating and substrate by pull-off way and get good repeatable test results.
- Electronically controlled hydraulic pump automatically applies smooth and continuous pull-off pressure. Greatly red-uces user effort and the risk of influencing the pulling process.
- Internal memory stores maximum pull-off pressure, rate of pull, test time, dolly size.
- Pull rate is controlled by PID closed-loop, stable and adjustable.
- Can set a constant pull force to judge if the coating could be separated from substrate under a certain force.
- 5.0 inch big touch screen, display pull-off force curve, operator can see clearly how it change throughout the test.



BGD 500S



Ordering Information→ Technical Parameters ↓	BGD 500 Digital Pull-off Adhesion Tester	BGD 500S Automatical Digital Pull-off Adhesion Tester
Dolly Size	20mm（standard）; 10mm, 14mm, 50mm, 50mm×50mm（optional）	
Resolution	0.01MPa（1psi）	
Accuracy	±1% full scale	
Max. Pull-off Pressure （MPa）	2.8–80（10mm dolly）; 1.4–40（14mm dolly） 0.7–20（20mm dolly）; 0.4–3.3（50mm dolly） 0.4–2.5（50mm square dolly）	4.0–96（10mm dolly）; 2.0–50（14mm dolly） 0.7–24（20mm dolly）; 0.1–3.8（50mm dolly） 0.1–3.0（50mm square dolly）
Pull-off Rate Set Range （MPa/s）	----	0.4–6.0（10mm dolly）; 0.2–3.0（14mm dolly） 0.1–1.5（20mm dolly）; 0.02–0.24（50mm dolly） 0.01–0.19（50mm square dolly）
Size/Weight	360mm×75mm×115mm/3 kg	240mm×138mm×81mm/4 kg
Power	Built-in rechargeable lithium battery, and standard configuration charging adapter.	
Standard Packing List	① Adhesion Tester ② 20mm Aluminum test dollies（20 pcs） ③ Cutting toll for 20mm dollies ④ 3M Adhesive and glue gun ⑤ Micro-USB cable ⑥ Operation Manual ⑦ Carrying case	
Accessories Ordering Information	BGD 500/Z-004---10mm Dolly（10 pcs/package） BGD 500/Z-006---20mm Dolly（10 pcs/package） BGD 500/Z-008---Cutting Tool for 20mm dolly BGD 500/W-041--3M Specified Adhesive BGD 500/J-042---Square Dolly（50mm×50mm） BGD 500/J-044---Specified Base for Square Dolly	BGD 500/Z-005---14mm Dolly（10 pcs/package） BGD 500/Z-007---50mm Dolly（10 pcs/package） BGD 500/Z-009---Cutting Tool for 50mm dolly BGD 500/J-036---50mm Circle Dolly Base BGD 500/J-043---Square Dolly Head

HARDNESS

Improving mechanical resistance is part of many quality requirements. One important criteria for assessing this feature is hardness.

Depending on the requirements there are various methods for testing hardness. Some are dedicated to characteristic coatings and others are more suitable for testing bulk materials such as metals, plastics, rubber or elastomers.

Biuged manufacture and supply a wide range of instrumentation designed for the hardness tests most frequently used in the industry-these include pendulum, scratching etc.

① Pencil Hardness Tester

This instrument offers an easy method for the determination of film hardness for coating applied to a flat substrate. The pencil lead, prepared beforehand by rubbing it on fine abrasive paper（400）, is maintained at an angle of 45° and pushed with uniform pressure onto the sample. Either leaving a superficial trace or causing destruction down to the substrate. It complies with the requirements of ASTM D3363, ISO 15184.

Furthermore, Biuged also offers BGD 506S/2 whose all materials are stainless steel. Besides all characteristics as above, BGD 506S/2 can lock pencil automatically and the block for adjusting level is designed as monolithic construction, which is convenient for operator to install and remove pencil and adjust working level, more easier and faster!



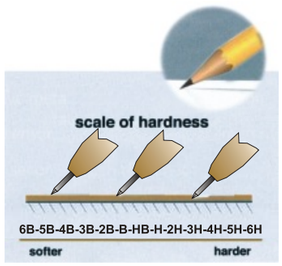


Moving more smoothly with axletree design



BGD 506S/2

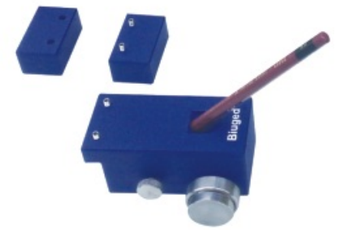
Main Technical Parameters：
★ Three points are touched on the tested surface（roller、pencil lead）
★ The angle between pencil and the tested surface： 45°
★ Built–in spirit bubble, convenient to check level when tester is working
★ Force of pencil tip： 500g/750g/765g/1000g
★ Packing List：
① Pencil Hardness Tester, Body
② 1 Set of Pencils (13) : 6B–5B–4B–3B–2B–B–HB–H–2H–3H–4H–5H–6H. （Chunghwa）. （BGD 506S/2 is equipped with Mitsubishi pencil）
③ Special Pencil Sharpener
④ Abrasive Paper, 400 grade grit.
⑤ Calibration Certificate
★ **Ordering Information**：
BGD 506/1–––– Pencil Hardness Tester（500g）
BGD 506/2–––– Pencil Hardness Tester（750g/7.35N±0.1N）
BGD 506S/2––––Pencil Hardness Tester（750g/7.35N±0.1N）
BGD 506/3–––– Pencil Hardness Tester（1000g）
BGD 506/4–––– Pencil Hardness Tester（7.5N±0.1N/765g）



② Adjustable Pencil Hardness Tester

BGD 505 Adjustable Pencil Hardness Tester is designed according with ASTM D 3363, ISO 15184. Operator can obtain three different forces of pencil tip（500g, 750g and 1000g）by selecting different loading weights.

Main Technical Parameters：
★ Three points are touched on the tested surface（roller, pencil core）
★ The angle between pencil and the tested surface is 45°
★ Force of pencil tip： 500g/750g/1000g
★ **Ordering Information:** BGD 505–––Adjustable Pencil Hardness Tester



③ Automatic Pencil Hardness Tester

BGD 507S Automatic Pencil Hardness Tester is a newly developed instrument for measuring the pencil hardness of coatings rapidly and accurately. It overcomes the defect of traditional manual pencil hardness tester that the speed cannot keep constant, and greatly eliminates the affect of human factors on the test results. In addition, the instrument can set different loads on pencil lead (no need any real weights), which meets different test standards and application requirements.

- User can set required moving speed, and the speed of whole scratch processes is stable.
- User can set different force for pencil tip according to different standards, such as 7.5N, 750g (7.35N), 500g, 1000g, etc.
- It's easy to fix the pencil by special designed fixture.
- The loads on pencil lead to be controlled by sensors, no need to adjust the level of instrument.
- Conforms to ISO 15184, ASTM D3363

Main Technical Parameters：
★ SettableRange of Pencil tip Force: 250g–1000g
★ Pencil Moving Distance: 80mm
★ Setting range of Pencil Moving Speed: 0.5mm/s–10mm/s
★ Applicable test panels size: 200mm×100mm
★ Applicable test panels thickness: ≤10mm
★ Overall Size（L×W×H）: 430mm×250mm×230mm
★ **Ordering Information:**
BGD 507S––– Automatic Pencil Hardness Tester





Mitsubishi Pencil

Used to test the film hardness specially，have 17 grades from 6B-9H

◆ **Ordering Information:** *UNI----A set of Mitsubishi Pencil*（*17 pcs/set*）
（6B-5B-4B-3B-2B-B-HB-F-H-2H-3H-4H-5H-6H-7H-8H-9H）



④ Pendulum Hardness Tester

A pendulum resting on a coating surface is set into oscillation and the time for the oscillation amplitude to decrease by an amount specified in this International Standard is measured. The shorter the damping time, the lower the hardness.

Two test procedures are considered in some detail, namely those of König and Persoz. （The Persoz and König methods differ by the period and amplitude of the oscillation. The Persoz test measures the time taken for the amplitude of oscillation to decrease from 12° to 4°; the König from 6° to 3°.）

The instruments embody the same principle that the amplitude of oscillation of a pendulum touching a surface decreases more rapidly the softer the surface but differ in respect of dimensions, period and amplitude of oscillation.

BGD 509 Pendulum Hardness Tester is the newest product which can be used in accordance with the following National and International Standards: ISO 1522, ASTM D4366, BS 3900-E5, DIN 53157, NBN T22-105, NF T30-016.

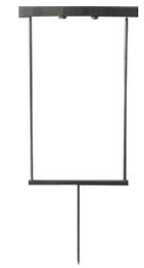
It's a simple to use instrument and can be supplied in one of three model types: Persoz, König, and Persoz & König combined

Features

- ◆ Large capacitive touch screen displays various testing parameters, environment temperature and humidity, with rich and intuitive content.
- ◆ Start automatically the test with one-button. automatically move the pendulum to the release position, automatically clamp the test panels, and automatically complete the test. High degree of automation, simpler operation, completely eliminating errors caused by human operation
- ◆ Uniquely designed automatic lifting working platform, which can automatically clamp the test panel in 3 seconds and continuously provide at least 25N of clamping force, with stable platform without shaking when the pendulum swings.
- ◆ High-precision pendulum machined with precision mechanical processing, strong stability, ensuring the reproducibility and comparability of test data, comparable to similar imported products.
- ◆ Overall lift-up organic glass door cover, convenient operation, greatly increasing the operation space, while reducing data deviations caused by air circulation. In addition, the unidirectional resistance design prevents the instrument from being impacted when the door cover closes instantly.
- ◆ Two test methods can be switched: K pendulum (König) or P pendulum (Persoz).
- ◆ Using an electromagnet to release the pendulum for more precise test results.
- ◆ Built-in high-precision horizontal inclinometer with an accuracy of 0.05° , allowing customers to directly observe the horizontal deviation on the touch screen for easy and quick adjustment.
- ◆ Automatically count and display the timing and counting of the test in real-time, automatically stop the test when the deviation reaches as low as 3° (König) or 4° (Persoz), while calculating the test period.
- ◆ View historical test data for easy data comparison by customers.
- ◆ Suitable for test plates of different thicknesses ranging from 0.1mm to 5.5mm
- ◆ Comes with a calibration certificate.



König Pendulum



Persoz Pendulum

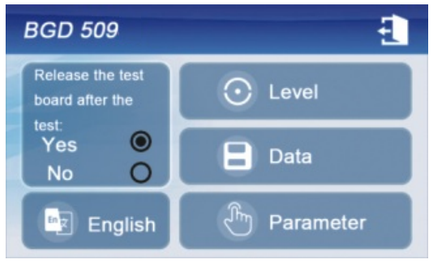


Ordering information→ Technical parameter ↓	BGD 509/K	BGD 509/P	BGD 509/K+P
Pendulum	König	Persoz	König+Persoz
Weight	200g ± 0.2	500g ± 0.1	200g ± 0.2/500g ± 0.1
Ball Diameter	5mm（0.2in）	8mm（0.3in）	5mm/8mm
Deflection Start	6°	12°	6° /12°
Deflection End	3°	4°	3° /4°
Period of Oscillation	1.4s	1s	1.4s/1s
Damping Time on Glass	250 ± 10s	430 ± 10s	250 ± 10s/430 ± 10s
Overall Size	425mm×400mm×810mm（L×W×H）		
Net Weigh	21.5 kg		



Main interface

Large capacitive touch screen displays various testing parameters, environment temperature and humidity, with rich and intuitive content.

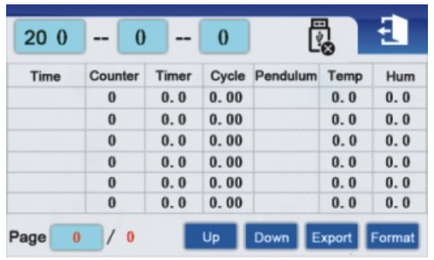


Settings Interface



Level Adjustment Interface:

Built–in high–precision horizontal inclinometer with an accuracy of 0.05° , allowing customers to directly observe the horizontal deviation on the touch screen for easy and quick adjustment.



Data Storage Interfac

View historical test data for easy data comparison by customers.

⑤ Buchholz Indentation Tester

BGD 510 Buchholz Indentation Tester is a reliable test method for evaluation of indentation resistance of plastic deformable coatings. A beveled disc with a sharp edge is applied onto the test surface under a constant 500g. Test load provided by a steel block holder. The trace left after 30 s. Load is measured with a 20X magnification illuminated microscope. The length of the indentation is inversely proportional to the hardness.

- Conform with Standard ISO 2815
- Stainless steel block
- Circular tool is a double cone block
- Circular tool and support of hard metal
- Marking triangle for precise positioning.
- 20x magnification with graduated scale to measure indentation length.

Main Technical Parameters：
★ Indentation load：500g ± 5g
★ Indentation Diameter：30mm ± 0.2mm
★ Indentation Width：5 ± 0.1mm
★ Indentation Angle：60° ± 0.5°
★ Accuracy of indentation reading：0.1mm
★ **Ordering Information**: BGD 510––– Buchholz Indentation Tester



⑥ Digital Shore Hardness Meter

This is the newest type Shore hardness meter in the market, which is used for Shore hardness testing with pocket size model and integrated probe. With RS 232 interface and can be switched off automatically. The meter screen can show hardness result, average value, max. value directly.

Standards: ISO 7619, ASTM D2240, BS EN ISO 868, DIN 53505, JIS K 6253

For getting a stable and accuracy reading, operator can choose a special holder while measuring. This holder can give a enough force through weights of meter pressing needle, thus ensure the meter foot could press on the sample completely.

Shore A is designed to measure the penetration hardness of rubber, elastomers and other rubber like substances such as neoprene, silicone, and vinyl. It can also be used for soft plastics, felt, leather and similar materials.

Shore C is designed for various foam and sponge.

Shore D is designed for plastics, Formica, Epoxies and Plexiglass.

Main Technical Parameters：
★ Measurement range:0–100HA(HC/HD)
★ Measurement deviation: < 1%H
★ Resolution: 0.1
★ Power supply: 4x1.5V AAA (UM–4) battery
★ Battery indicator: low battery indicator
★ Dimensions: 162mm × 65mm × 38mm
★ Weight (not including probe):173g
★ **Ordering information**：
BGD 935/A–––Digital Shore A Hardness Meter
BGD 935/C–––Digital Shore C Hardness Meter
BGD 935/D–––Digital Shore D Hardness Meter
BGD 1296––– Special Holder for Shore Hardness Meter



BGD 1296



⑦ Hardness Test Pencil

BGD 511 Hardness Test Pencil is designed to test the resistance of a coating to scratches (writing effect or metal marking) by a usually hand-held loaded stylus simply and quickly, especially on curved surfaces or on small test specimens (minimum dimensions 30mm× 50mm). It comfirms to ISO 22557 *Paints and varnishes - Scratch test using a spring-loaded pen.*

The test can be carried out as method A using a point stylus (diameter 0,50mm, 0,75mm, or 1,00mm) or as method B using a disc stylus (made of stainless steel, copper, thermoset, or PMMA [Polymethyl methacrylate]). A stylus loaded with a test load between 0,5N to 20N is manually moved over the coating surface. The so introduced damage is visually (magnifier) examined and assessed.

The handling of the Hardness Test Pencil is extremely simple. The estimated or known spring tension is set with the help of the slider. Holding the instrument upright and placing its point on the test surface one draws a 5 to 10mm long line at a rate of approximately 10mm/sec. The stylus should produce a scratch which is just visible with the naked eye. If the spring pressure is too high, the scratch is clearly visible; if too low, no scratch appears. The applied pressure, fixed by locking the slider, is marked in Newton's.

Three scales are engraved into the test pencil for the three pressure ranges:

No.1: 0 - 3 N (blue marked, graduation 0.1N)
No.2: 0 - 10 N (red marked, graduation 0.5N)
No.3: 0 - 20 N (yellow marked, graduation 1N).

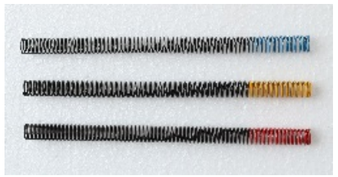
Main Technical Parameters：
★ Total length：160mm；Net Weight：approx. 250g
★ Diameter：16mm
★ Standard kit includes：
1 Test tip：(0.75mm dia.–Bosch)
3 Springs (0 – 3N; 0 – 10N; 0 – 20N)
1 Plastic carrying case



BGD 511/A

★ **Ordering information:**
BGD 511/A–––Hardness Test Pencil (Method A)
BGD 511/B–––Hardness Test Pencil (Method B)
BGD 511/Z–001–––Head Piece with Supporting wheels
BGD 511/Z–002–––Point Stylus A1 (0.5 mm, tungsten carbide)
BGD 511/Z–003–––Point Stylus A2 (0.75 mm, tungsten carbide)
BGD 511/Z–004–––Point Stylus A3 (1.0 mm, tungsten carbide)
BGD 511/2–J–005–––Disc Stylus B1 (Stainless steel)
BGD 511/2–J–006–––Disc Stylus B2 (Copper)
BGD 511/J–009–––Blue Spring (0–3N)
BGD 511/J–010–––Red Spring (0–10N)
BGD 511/J–011–––Yellow Spring (0–20N)







BGD 511/B

⑧ Automatic Scratch Tester

Coatings and paints can protect, decorate substrate or conceal the defects of substrate, and these three functions are related with coatings hardness. And hardness is the important performance for paint mechanical strength, as well as the important indicator to judge paint quality. One of important indicators to evaluate coatings hardness is scratch tester.

ISO 1518 *Paints and varnishes -- Determination of scratch resistance* specifies a test method for determining under defined conditions the resistance of a single coating or a multi-coat system of paint, varnish or related product to penetration by scratching with a scratch stylus loaded with a specified load. Penetration of the stylus is to the substrate, except in the case of a multi-coat system, in which case the stylus can penetrate either to the substrate or to an intermediate coat.

This test has been found to be useful in comparing the scratch resistance of different coatings. It is most useful in providing relative ratings for a series of coated panels exhibiting significant differences in scratch resistance.

Before 2011, there is only one standard which is used to evaluate paint scratch resistance, which against to evaluate scientifically to paints scratch resistance under different applications. After revise this standard on 2011, this test method is divided two parts: One is constant-loading, i.e the loading to panels is constant during the scratch test, and the test results isshown as max. weights which don't damage coatings. The other is variable loading, i.e. the loading on which stylus loads test panel is increased continuously from 0 during the whole test, then measure the distance from finial point to the other point when

Characters

- ◆ High-definition touch screen for easy operation, delivering clearer and more comprehensive displayed information.
- ◆ Driven by stepper motor; the scratching speed supports stepless speed regulation over a wide range, and the scratching stroke can be arbitrarily set between 10 mm and 120 mm.
- ◆ Guided by precision linear guide rails to ensure stable operation during scratching.
- ◆ Extra-large work platform with forward and backward movement function, enabling users to quickly switch between different test areas on the same test panel.
- ◆ The test panel clamping block is position-adjustable according to panel dimensions to accommodate substrates of various sizes.
- ◆ Standard-equipped with an adjustable scribe needle height device for simple, rapid operation, compatible with test panels of different thicknesses (maximum thickness: 50 mm).
- ◆ Audible and visual alarm system activates when the scribe needle penetrates through the test panel for intuitive statusindication.
- ◆ Compatible with constant-load or variable-load tests by replacing test assemblies.
- ◆ Calibration certificate included as standard.





Ordering information→ Technical parameter↓	BGD 520/1 Automatic Scratch Teter （Constant-loading）	BGD 520/2 Automatic Scratch Teter （Variable-loading）
Conform standards	ISO 1518–1; BS 3900：E2	ISO 1518–2
Stylus	Having a hemispherical hard–metal tip of radius （0.50±0.01）mm	Coned sapphire or diamond, the tip radius is 0.03mm
Weight	0.5N×1, 1N×1, 2N×2, 5N×1, 10N×1	(0g～50g)×1, (0g～100g)×1, (0g～200g)×1, 100g ×1, 200g×1
Working distance	10mm~120mm	
Stylus moving speed	5mm/s~40mm/s（stepless speed regulation）	
Angle between stylus and sample	90°	
Max. panel size	200mm×100mm	
Max. panel thickness	0mm~25mm	
Power Supply	110V~220V, 50/60Hz	
Overall Size (L×W×H)	510mm×320mm×250mm	
Net weight	17kg	

Optional Accessories

BGD 520/1–J–069–––Scratch stylus A, having a hemispherical hard–metal tip of radius (0,50± 0,01) mm.

BGD 520/1–J–080–––Scratch stylus B, having a hemispherical hard–metal tip of radius (0,25± 0,01) mm.

BGD 520/2–W–001–––Stylus for BGD 520/2

BGD 520/Z–001–––Constant–loading Test Kit（Includes weights: 0.5 N×1, 1 N ×1, 2 N×2, 5 N×1, 10 N×1; 1 piece of Scratch stylus A）

BGD 520Z–002–––Variable–loading Test Kit（Includes sliding weights: 0~50 g×1, 0~100 g×1, 0~200 g×1; fixed weights: 100 g×1, 200 g×1; 1 piece of Scratch stylus E）

⑨ Mar Resistance Tester

What is "Mar": blemish on the surface of a coating, extending over a particular area of the coating and visible due to the difference in the light-reflection properties of the area affected compared with the light-reflection properties of adjacent areas.

Mar resistance test for coatings is very similar with scratch resistance test, but this test uses arc（loop-shaped or ring-shaped）stylus to test the mar resistance of a single coating of a paint, varnish or related product, or the upper layer of a multi-coat system.

The product or system under test is applied at uniform thickness to flat panels of uniform surface texture. After drying/curing, the mar resistance is determined by pushing the panels beneath a curved (loop-shaped or ring-shaped) stylus which is mounted so that it presses down on the surface of the test panel at an angle of 45°. The load on the test panel is increased in steps until the coating is marred.

This test has been found to be useful in comparing the mar resistance of different coatings. It is most useful in providing relative ratings for a series of coated panels exhibiting significant differences in mar resistance. Kindly note this test does not specify a method using a pointed stylus, two of which are specified in ISO 1518-1 and ISO 1518-2, respectively. The choice between the three methods will depend on the particular practical problem.

BGD 536 Mar resistance Tester produced by Biuged confirms the newest international standard ISO 12137-2011, ASTM D2197 and ASTM D5178. It can offer from 100 g to 5,000 g load to test panel.

Characters

- ◆ Working speed can be adjusted from 0 mm/s~10 mm/s
- ◆ Double adjusting balance device to reduce the test error because of level.
- ◆ Moveable working table is convenient for operator do more tests at different areas in the same test panel.
- ◆ Liftable balance arm can do mar test on the different thickness panels from 0mm~12mm

Main Technical Parameters：

- ★ Motor Power: 15 W
- ★ Working Distance: 80 mm
- ★ Weights: 1×100 gram, 2×200 gram, 1×500 gram, 2×1000 gram, 1×2000 gram
- ★ Ring–shaped Stylus: Diameter (6.5±0.1) mm, R0.8±0.02, Thickness (1.6±0.02) mm; With smooth surface and hardness is RockWell HRC56 to HRC58 and its surface shall be smooth (roughness≤0.05 μm).
- ★ Stylus moving speed: 3 mm/s~10 mm/s (step: 0.5mm/s)
- ★ Angle between stylus with test panels: 45°
- ★ Suitable Test panels Width: 40 mm~110 mm
- ★ Suitable Test panels Thickness: 0 mm~12 mm
- ★ Power: Input 110~240V AC 50/60Hz (Power adapter output 24V, 2A)
- ★ Overall Size: 540mm×250mm×375mm (L×W×H)
- ★ Weight: 15 kg
- ★ **Ordering information:**

BGD 536–––Mar Resistance Tester

BGD 536/J–059–––Ring–shaped Stylus



FLEXIBILITY

① Hinge-type Cylindrical Mandrel Tester

It is used to assess the pliability of the paint film through the capability that the paint film deforms with bottom material and does not get damage at the specified standard conditions. It is expressed with the minimum shaft stick diameter which does not cause the paint film to crack when the test plate moves around the shaft stick of 180° within 1-3 seconds at the specific conditions in the standard. It confirms to ISO 1519, ASTM D522, DIN 53152.

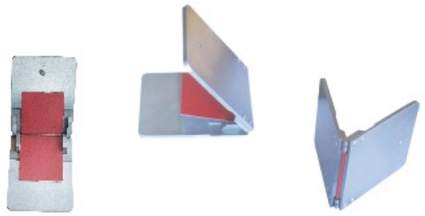
This tester consists of eight hinges and each hinge has different diameter axis. Put the test panels into hinge then fold it and test panels then have finished 180° bend.

The test can be carried out:

---either as a "pass/fail" test, by carrying out the test with a single specified size of mandrel, to assess compliance with a particular requirement;

---or by repeating the procedure using successively smaller mandrels to determine the diameter of the first mandrel over which the coating cracks and/or becomes detached from the substrate.

Main Technical Parameters:
★ Shaft stick diameter: 2mm, 3mm, 4mm, 5mm, 6mm, 8mm, 10mm, 12mm
★ Thickness of bottom material for the test plate: less than 0.3mm
★ **Ordering Information**:
BGD 561---Hinge-type Cylindrical Mandrel Tester



② Cylindrical Mandrel Tester

BGD 564 Cylindrical Mandrel Tester complies with ISO 1519：2011，ASTM D522 and DIN 53152.It is used to assess the resistance of a coating of paint, varnish or related product to cracking and/or detachment from a metal or plastic substrate when subjected to bending round a cylindrical mandrel under standard conditions.

This tester consists of three PVC rolls wich are arranged side by side and run on pivoting bearings. Thus, the coating is not exposed to damge or shear stress during the test.

The test can be carried out:

---either as a "pass/fail" test, by carrying out the test with a single specified size of mandrel, to assess compliance with a particular requirement;

---or by repeating the procedure using successively smaller mandrels to determine the diameter of the first mandrel over wich the coating cracks and/or becomes detached from the substrate.

Main Technical Parameters:
★ Latest and humanization design, convenient and quick to operate.
★ 12 pcs stainless steel mandrels with different diameters: Φ2, Φ3, Φ4, Φ5, Φ6, Φ8, Φ10, Φ12, Φ16, Φ20, Φ25, Φ32mm
★ All mandrels are machined precisely by high hardness stainless steel, 2mm and 3mm mandrels are done by hardening treatment, it won't be deformed even bend the thick test panels.
★ Suitable test panels size: Length 120mm~150mm; width ≤80mm; thickness≤1.0mm
★ Come with Calibration Certification
★ **Ordering Information**:
BGD 564--Cylindrical Mandrel Tester

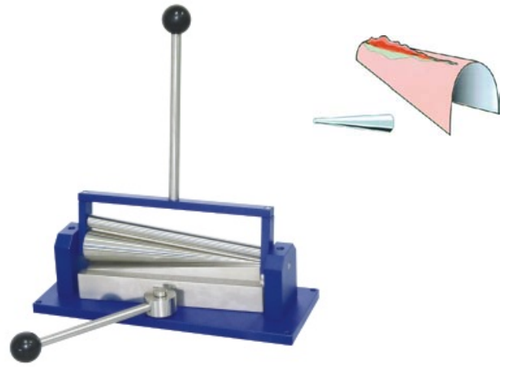


③ Conical Mandrel Tester

BGD 566 Conical Mandrel Tester is applicable to determine extensibility of paint coatings on metal panels which are clamped in position and formed round the conical mandrel by rotating of the roller frame. The panels are examined to evaluate crack resistance and detachment from the metal substrate of coated surface which is coated with paint under standard condition. It complies with ASTM D522, D1737, BS 3900E11 and ISO 6860 Standard.

This instrument allows easy identification in a single operation the coating failure at specified diameter, over part or entire mandrel length.

Main Technical Parameters:
★ Dimension of conical mandrel: Big end: Φ38±0.1mm; Small end: Φ3.1±0.1mm; Length: 203±0.3 mm
★ New clamping device make fixing sample become faster and more convenient
★ Suitable test panels size: Length≤200mm; Width ＜100mm; Thickness≤0.8mm
★ Overall dimensions: 300mm×120mm×83mm (L×W×H)
★ Come with Calibration Certification
★ Weight: 7 kg
★ **Ordering Information**:
BGD 566---Conical Mandrel Tester



④ T-Bend Tester

BGD 568 T-Bend Tester is designed to evaluate the flexibility and adhesion of an organic coating on a metallic substrate by observing the cracking or loss of adhesion when a coated test panel is bent.This method can be used to confirm whether paints, varnishes or related products meet a given test requirement in a pass/fail test, or to determine the minimum bending diameter at which cracking does not occur.

Coated panels are bent back on themselves to 180°, with the coated surface on the outside of the bend, at progressively less severe radii of curvature, the radii of curvature being defined by spacers or mandrels. After bending, each panel is examined with a magnifying glass for cracking of the coating and by a tape pull-off test for loss of adhesion of the coating. The minimum diameter to which the test panel can be bent without cracking or loss of adhesion, i.e.when failures on longer occur, is taken as the T-bend rating.

It conforms with DIN EN ISO 17132, ASTM D4145, EN 13523-7 《Paints and varnishes - T-bend test》 "Folding method"

Main Technical Parameters:
★ Max. thickness for sample: 1.0mm (steel panel); 2.0mm (aluminum panel)
★ Width of panel: ＜100mm
★ Weight: 50 kg
★ Overall Size: 350mm×300mm×190mm (L×W×H)
Ordering Information: BGD 568---T-Bend Tester



IMPACT

① Tubular Impact Tester

Impact test describes a method for evaluating the resistance of a dry film of paint,varnish or related product to cracking or peeling from a substrate when it is subjected to a deformation caused by a falling weight.

The coating under test is applied to suitable, thin（normally metal）panels. After the coating has cured, a standard weight is dropped on the each panel from a height that will cause deformation of the coating and the substrate. The test can be carried out with the coated side of the panel facing upwards（i.e.towards the falling weight）or downwards（i.e away from the weight）.By gradually increasing the height from which the weight drops, the point at which failure occurs can be determined.Films generally fail by cracking, which is made more visible by the use of a magnifier.

The test can be carried out:

---Either as a “pass/fail” test, the test being carried out from one drop height and with a specified mass, so as to test compliance with a particular specification.

---or as a classification test, to determine, by gradually increasing the drop height and/or the mass, the minimum mass and/or drop height for which the coating cracks or peels from its substrate.

Biuged offers many different types impact testers according to different standards. These impact testers consist of a solid base with a guide tube support, some different weights hammers（falling weights）and some different diameters punches. Users can choose different size and weight hammer to simulate paint used different environments.



BGD 305



BGD 306

Ordering Information→ Technical parameter ↓	BGD 305 Heavy-Duty Tubular Impact Tester	BGD 306 ISO Tubular Impact Tester
Features	◆ Latest design make changing punch, weight and die become more easy and faster. ◆ The aluminum oxid guide tube is produced by special technology, never fade and rust. ◆ Special structure design make impact groove won't deviate forever, no calibration. ◆ Come with Calibration Certificate.	◆ Ring slot (stops) for height limitation, convenient for operator to adjust different impact depth. ◆ The aluminum oxid guide tube is produced by special technology, never fade and rust. ◆ Guide tube is produced by special mould, the gap with weight is controlled precisely. ◆ Come with Calibration Certificate.
Falling Height	0–1,210mm（48 inch）	0–1,010mm（40 inch）
Graduation	1cm	
Falling Weights	1,000g（2 pcs）, 300g（1 pc）, 2 lb（2 pcs）	Main weight with indenter：1,000g（1 pc） Additional weight：1,000g（1 pc） Additional weight：2,000g（1 pc）
Indenter Diameter	Φ12.7mm（1/2 inch）、Φ15.9mm（5/8 inch）	Φ20mm
Die inside Diameter	Φ16.3mm	Φ27mm
Standards	ASTM D 2794, ISO 6272.2	ISO 6272.1
Overall Size	305mm×270mm×1350mm（L×W×H）	300mm×240mm×1400mm（L×W×H）
Net Weight	27.5 kg（with all weights）	22.0 kg（with all weights）

② Dupont Impact Tester

BGD 301 Dupont Impact Tester is designed to test the impact endurance of coating material（after coated）. It is equipped with 5 different diameter indenters and relevant dies, 3 different weight weights.

To do an impacting test for painting and coating materials is to use an indenter with various round angles to touch the specimen in the beginning, and then a selected weight free dropping from a certain height to hit the indenter to impact the specimen. Running the same way to test three more specimens, and put and leave them for an hour, and then watch if there is any damage（crack or derformation） on the coating.

It is compatible with ASTM D2794, JIS K 5400, CNS 10756.

Main Technical Parameters：

- ★ Impact Height: 50mm–500mm（grade: 50mm）
- ★ Weights: 300g、500g、1000g
- ★ Indenter Diameter: 1/2 " , 1/4 " , 1/8 " , 1/16 " , 3/16 " each
- ★ Die Holder Diameter: 1/2 " , 1/4 " , 1/8 " , 1/16 " , 3/16 " each
- ★ Overall Size（L×W×H）: 380mm×240mm×800mm
- ★ Net Weight（includes all weights）: 24 kg
- ★ **Ordering Information**: BGD 301---DuPont Impact Tester



③ Digital Cupping Tester

BGD 309 Cupping Tester is applicable to evaluate crack resistance and detachment from the metal substrate of coated surface which is coated with paint, varnish, etc., after the coating layer is deformed gradually under standard condition. The sample panel（max. 1.25mm thick× 70mm width, coated min.0.03mm）is clamped by an upper wheel and manually cupped by a φ20mm hemispherical indenter onto a φ27mm die by a drive wheel. The depth to cause failure is indicated on a precise digital display. The results can be easily observed with an illuminated magnifier

- ◆ Compliance with ISO 1520, BS 3900 Part 4, DIN 53166, DIN 53233 etc.
- ◆ Automatic coordinate positioning system: tester can memorize the home position after being zeroed, also track the punch's position automatically. Therefore, the traditional error caused by return or shake can be avoided.
- ◆ Highly precise position sensor: the minimum division value of the depression depth can reach 0.01mm.
- ◆ Applicable for every kind of substrate, and the maximum pressure can reach 2,500N.
- ◆ The coordinate position of the plug can be zeroed manually and can be memorized.
- ◆ Come with 10X illuminated mangnifier, convenient to observe and judge test result.
- ◆ Hand twist operation: laborsaving and easy-handling.

Main Technical Parameters：

- ★ Diameter of punch: φ20mm
- ★ Maximum dent depth: 12mm
- ★ Maximum depress power: 2,500N
- ★ Resolution of dent: 0.01mm
- ★ Counter: digital display, in 0.01mm increments
- ★ Dimension of test panel: 150mm×70mm ×0.03–1.25mm（Smooth, not deformed）
- ★ Material: polished steel panel
- ★ Net Weight: 28 kg
- ★ Overall Size: 290mm×240mm×370mm（L×W×H）
- ★ **Ordering Information:**

  BGD 309---Digital Cupping Tester



④ Automatic Cupping Tester

BGD 310 is a automatic cupping tester. On the base of BGD 309, this machine's punch can rise automatically at the speed of 0.2mm/s which is required by standard. Eliminate the error coming from hand lifting.

Moreover, BGD 310 automatic cupping tester is equipped with a high definition screen, operator can observe clearly the damages（cracking）from tested specimen, thus judge test result easily and more precise.

It conforms ISO 1520, BS 3900 Part 4, DIN 53166, DIN 53233 etc.

Features:

- ◆ Punch is lifted automatically（Constant speed: 0.2mm/s）, get more reliable and more comparable test results.
- ◆ Automatic coordinate positioning system: machine can memorize the home position after being zeroed, and locate the punch position automatically.
- ◆ High-power magnifier and high definition showing screen, judging test results is easier and more directly.And no need to focus during the whole test.
- ◆ The lifting distance of punch can be set freely from 0~18mm
- ◆ High precision raster displacement sensor
- ◆ The max. width of test panel can be 90mm

For the BGD 310/VI automatic cupping tester equipped with image recognition capabilities, it adopts an industrial camera vision system and self-developed software. The instrument can automatically detect the critical point at which cracks first appear on the coated surface of the test panel and stop operation accordingly, while simultaneously recording the current coordinate parameters (indentation depth). This significantly reduces human judgment errors and effectively improves the reproducibility and comparability of test results. Additionally, the instrument features the following characteristics:

- ◆ Built-in micro PC for efficient and accurate data processing;
- ◆ Adjustable indentation speed within a range of 0.1 mm/s to 0.3 mm/s;
- ◆ Supports external keyboard, mouse, and display (HDMI) connections for diversified operation methods.

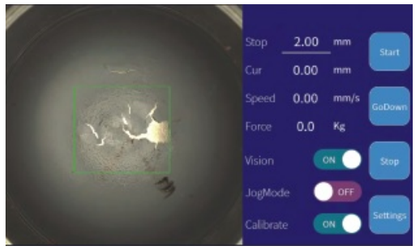
Main Technical Parameters：
★ Diameter of punch: ϕ20mm（0.8 inch）
★ Maximum dent depth: 18mm
★ Maximum depress power: 2,5000N
★ Precision of dent: 0.01mm
★ Max. Thickness of TestPanel: 0.7mm（Stainless Steel）, 1.25mm（A3 Steel）, 2mm（Aluminum）
★ Net Weight: 52 kg（BGD 310）; 48 kg（BGD 310–VI）
★ Ovenall Size（L×D×H）, mm: 466×322×500（BGD 310）; 330×360×490（BGD 310–VI）
★ **Ordering Information**:
BGD 310–––Automatic Digital Cupping Tester
BGD 310–VI–––Automatic Digital Cupping Tester with Image Recognition



BGD 310



BGD 310–VI



ABRASION

① Wet Abrasion Scrub Tester

Paint often become soiled especially near doorways, windows, and in work and play areas. Coated surfaces need to be tested for resistance to abrasion caused by a brush, sponge, or other means. The Wet Abrasion Scrub Tester can produce a repeatable, controlled condition to simulate everyday use or wear patterns.

BGD 526 Wet Abrasion Scrub Tester is the newest machine which is developed by Biuged . It can examine washability and related properties that affect the stain resistance of coatings. Detergent performance testing can also be determined in a reproducible manner.

It accords with standards such as ASTM D2486, ASTM D3450, ASTM D4213, ASTM D4828, DIN EN 11330, EN. ISO 11998 etc.

Feature:

- ◆ Running speed can be set to meet requirements of different standards.
- ◆ With five-digit counter, start the machine and it will automatically be stopped when reaching set times.
- ◆ Compatible with a variety of abrasion pads to comply with different standards requirements, such as ISO, ASTM, DIN etc.
- ◆ Quickly and easily to load and unload testing samples and replacing abrasion head.
- ◆ Can work normally under different voltage and frequency
- ◆ With stable and uniform running speed because of Push-rod design
- ◆ Features two brush holders for side by side testing
- ◆ Long service life with hard and durable design
- ◆ The whole machine body is made of anodized aluminum, having stable working status, repeatable test results, no exception Even in the fastest speed of the stroke.
- ◆ With peristaltic pump design, control scrub medium flow accurately.

Main Technical Parameters：
★ Specification of brush：Nylon brush bristles in 5/4 pattern extending 19 mm from block.
★ Weight of brush （including device holding brush）: 454±10 g（ASTM D 2486）; 135±1g（ISO 11998）
★ Stroke Length：300mm
★ Frequency of travel：10～99 times/min（adjustable）
★ Range of count：0~99,999 times
★ Size of test plate：430mm×150mm×0.03mm
★ Power of motor：25W
★ Power：110V～220V；50/60 Hz
★ Overall size：590mm×578mm×320mm（L×W×H）
★ Net Weight：26 kg
★ Capacity of Water Container：1L





Ordering Information:

BGD 526/1–––Wet Abrasion Scrub Tester（ASTM D 2486）
BGD 526/2–––Wet Abrasion Scrub Tester（ISO 11998）
BGD 526/3–––Wet Abrasion Scrub Tester（ASTM D 3450）
BGD 526/4–––Wet Abrasion Scrub Tester（ASTM D 4213）
BGD 526/5–––Wet Abrasion Scrub Tester（ASTM D 4828）
BGD 526/6–––Wet Abrasion Scrub Tester（DIN 53778）
BGD 526/C–––Multifunction Abrasion Scrub Tester（Adjustable Stroke Length from 0~300mm）
BGD 526/8–––Wet Abrasion Scrub Tester（ASTM D 2486& ISO 11998）

Optional Accessories for BGD 526:

BGD 526/Z–006–––Abrasion Heads for DIN 53778（Hog Bristle Brush+ Weights, total weigh is 250 ± 10g）

BGD 526/Z–009–––Abrasion Heads for ISO 11998（3M Scotch Brite handpads + Weights, total weigh is 135 ± 1g）

BGD 526/Z–010–––Abrasion Heads for ASMT D2486（Nylon+ Weights, total weigh is 454 ± 10g）

BGD 526/Z–011–––Abrasion Heads for ASTM D3450（Sponge+ Weights, total weigh is 1,500g）

BGD 526/Z–012–––Abrasion Heads for ASTM D4213（Sponge+3M Scotch Brite handpads + Weights, total weigh is 470 ± 10g）

BGD 526/Z–013–––Abrasion Heads for ASTM D4828（Sponge+ Weights, total weigh is 1000 ± 10g）

BGD 526/Z–018–––Special nylon brush（ASTM D2486；1 pair）

BGD 526/Z–021–––Hog Bristle Brush（1 pair）

BGD 526/Z–022–––Sponges （ASTM D4213；12 purchase）

BGD 526/W–030–––Sponges （ASTM D3450& ASTM D 4828；12 purchase）

BGD 526/Z–023 –––Abrasive pad（3M Scotch Brite ®handpads）（ISO 11998；Size––– 90 × 39mm; Pack of 50 pairs）

BGD 526/J–115–––Locating Frame for brush&abrasive pad（Used in conjunction with BGD 526/Z–006,BGD 526/Z–009、BGD 526/Z–010）

BGD 526/J–119–––Locating Frame for sponges（Used in conjunction with BGD 526/Z–011, BGD 526/Z–012, BGD 526/Z–013）

BGD 526/J–123–––Brass Shim （165mm × 12.7mmm × 0.25mm；pack of 10 pairs）

BGD 2208–––Black plastic panel（432mm × 165mm × 0.25mm；pack of 100 pcs）

Optional Accessories for BGD 526/T

BGD 526/Z–025–––Abrasion Heads for ASTM D 4752&D 5402（Absorbent cotton gauze+ Weights, total weigh is 1,000 ± 1 Abrasion area 1.5 cm^2）

BGD 526/Z–027–––Abrasion Heads for Rub Resistance（For printed materials, Offset paper+weights, total weight is 20N ± 0.2N）

BGD 526/Z–028–––Abrasion Heads for Alcohol Resistance（1cm^2 area, 25g/50g/100g/200g/500g weights+Cotton gauze）

BGD 526/Z–029–––Abrasion Heads for Rubber Resistance（25g/50g/100g/200g/500g weights+5 rubbers）

BGD 526/Z–030–––Abrasion Heads for ASTM D 7835（Absorbent cotton gauze+ Weights, total weigh is 3,000 ± 10g；Abrasion area 2.0 cm^2）

② Wet Abrasion Scrub Tester with Image Recognition

Introduction: For the scrub resistance of wall paints and related products, operator should record the number of cycles to remove one continuous thin line of paint film across the 12.7mm（1/2 in.）width of the shim. But how to judge this 12.7mm length accurately? different operators always have their different judging standards. To accurately and quickly determine the end point of the test, it is not only necessary for the operator to have a preliminary prediction of the cycles of scrub resistance of the test samples, but also for them to be able to accurately identify the length of the removed paint film. However, it is quite difficult in actual operation.

BGD 526/VI Wet Abrasion Scrub Tester with Image Recognition is equipped with the function of automatically identifying and calculating the length of the test sample from being abraded to the substrate (exposed bottom). It can monitor the wet abrasion scrub of the samples of two channels at the same time, no need to look at the sample on site. Once the exposed length of the test sample reaches the "threshold" set by the operator, the instrument will automatically stop and record the current scrub times, so as to truly achieve unattended. In addition, the operator can also browse the actual pictures of the test panel after scrubbing for any number of times, and can export the pictures to the U disk for checking.

Features:

◆ Double working channel, each channel can measure the length of the exposed bottom visually. When it reaches the set threshold, it will stop automatically.

◆ Equipped with 8-inch touch screen, which can display clearly and run smoothly.

◆ Compatible with a variety of abrasion pads to comply with different standards requirements, such as ISO, ASTM, DIN etc.

◆ Quickly and easily to load and unload testing samples and replacing abrasion head.

◆ Can work normally under different voltage and frequency.

◆ With the design of push rod, the running speed is stable and uniform.

◆ Features two brush holders for side by side testing.

◆ Long service life with hard and durable design.

◆ The whole machine body is made of anodized aluminum, having stable working status, repeatable test results, no exception even in the fastest speed of the stroke.

◆ The solution (scrub medium) flows into the brush through the peristaltic pump on the side of the tester, and can be accurately controlled.

Main Technical Parameters：
★ Weight of brush: (450 ± 10) g
★ Speed: the setting range is (10~99) times/min, and the visual detection range is (10~60) times/min
★ Stroke length: 0~300mm (adjustable), can meet different test requirements
★ Range of count: 0~99,999 times
★ Glass plate size: 430mm × 306mm
★ Capacity of liquid container: 1L
★ Power: AC 110V/220V, 50Hz/60Hz
★ Overall size (mm): 590 × 460 × 720
★ Net weight: 30 kg
★ **Ordering information:**
BGD 526/VI–––Wet Abrasion Scrub Testerw ith Image Recognition



③ Solvent Rub Resistance Tester

BGD 521 Solvent Rub Resistance Tester is designed according to ASTM D4752 and NCCA11-18 *Test Method for Measuring MEK Resistance of Ethyl Silicate (Inorganic) Zinc-Rich Primers by Solvent Rub*. The Solvent Rub Test is usually performed using methyl ethyl ketone (MEK) as the solvent. The MEK resistance or degree of cure applies to paint topcoats and primers.

ASTM D4752 involves rubbing the surface of a baked film with cheesecloth soaked with MEK until failure or break through of the film occurs. The type of cheesecloth, the stroke distance, the stroke rate, and approximate applied pressure of the rub are specified. The rubs are counted as a double rub (one rub forward and one rub backward constitutes a double rub).

The test is used widely in the paint industry because it provides a quick relative estimation of degree of cure without having to wait for long-term exposure results. It has been reported that the tests of two-componet zinc-rich primers has shown good correlation with the cure of the primer as determined by diffuse reflectance infrared spectroscopy.

◆ Intelligent microcontroller control, featuring stepless speed adjustment and automatic counting

◆ Touchscreen interface that directly displays friction speed, friction cycles, and preset test cycles

◆ Wide voltage range design (110-220V; 50/60Hz), good compatibility

◆ Parameters set freely and permanently storage.

◆ Glass work platform is easy to clean

Main Technical Parameters：
★ Rubbing weight: 1,000 ± 10 g
★ Rubbing speed: 5–95/min（stepless speed regulation）
★ Rubbing head diameter: 14 ± 0.5 mm （area is 1.5 cm^2）
★ Rubbing Distance: 120mm （also can be customized）
★ Rubbing times: 0~9,999
★ Power Supply: AC 110V ~ 220V； 50Hz ~ 60 Hz
★ Overall Size: 350mm × 375mm × 305mm（L × W × H）
★ Net Weight: 16.7 kg
★ **Ordering Information:**
BGD 521–––Solvent Rub Resistance Tester



④ Turnable Abrasion Tester

BGD 523 Turnable Abrasion Tester is applicable to determine abrasion resistance performance of various coatings. It is also used to determine abrasion resistance of paper, plastic, textile fabric, decorations, etc.

Two abrasive rubber wheels are mounted to pivoting arms and pressed onto the coating of the rotating test specimen applying the agreed test load. The eccentric arrangement of the axes of the abrasive wheels relative to the axis of rotation causes a crosswise abrasive wear in a ring-shaped zone (the area is about 30 sq.cm). The loss of mass of the coating caused by abrasive wear after the agreed number of cycles is determined.

The degree of abrasion for the specimen also depends on the load force（500g,750g or 1000g on each arm）being acted onto the axial of the 2Arms, which has a load pressure of 250g.

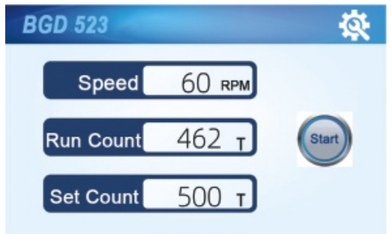
It confirms to DIN 52347 53109 53754 53799

ISO 5470, 9352, 3573, 4586-2, 7784-2

ASTM C217, D1044, D3389, D4060, D5342

Feature

- ◆ Operate and display all parameters by a color touch screen, more visual,simple and convenient.
- ◆ Changeable working platform for wood abrasion (The test panels max.thickness can be up to 25mm)
- ◆ Can select many different sorts abrasion medium for different tests
- ◆ Specimen turntable speed control options of both 60 rpm and 72 rpm.
- ◆ LCD display for accurate and convenient setting and monitoring to the whole test.
- ◆ Three different precise stainless steel weights (500g, 750g, 1000g) ensure the different requirements for different loads. Weights are marked to show total load on each wheel. This marking includes the weight of the abrading arm (250 grams)
- ◆ Abrading arms and fixing sleeve of abrading wheel have been calibrated and balanced before leaving factory.
- ◆ A vacuum system is included and equipped with cleaner to move the loose abrading's or any dirt
- ◆ A precision vacuum nozzle adjustment control allows the height to be modified for accommodating varying specimen thickness.
- ◆ A Quick Release Mounting Hub permits quick wheel mounting without the need of a locking nut.
- ◆ The cleaner is powered by abrasion tester, stopping test means stopping cleaner
- ◆ Equipped with S-11 Resurfacing medium disc from Taber company
- ◆ Equipped with a pair of standard abrasive rubber wheel CS-10 or CS-17 from Taber company





Main Technical Parameters：
★ Platform speed：60 ± 2r/min or 72 ± 2r/min
★ Range of count：0 ~ 99,999 times
★ Specimen size requirement：Φ100 × Φ8 (center hole) × 3mm
Thickness：BGD 522→20mm ~ 25mm；BGD 523→0 ~ 6mm
★ Dimension of abrasive sheet：Φ50 × Φ16 (center hole) × 13mm
★ Load weight：500g−750g−1000g
★ Main motor power：25W 220V 50Hz
★ Overall Size：340mm × 250mm × 300mm (L × W × H)
★ Net Weight：20 kg
★ **Ordering Information:**
BGD 522−−−Turnable Abrasion Tester （for wood）
BGD 523−−−Turnable Abrasion Tester（for paint film）
CS−10−−−Taber Abrading Wheels（For Organic coatings, plastics, textiles, leather）
CS−17−−−Taber Abrading Wheels（For Anodized aluminum, powder coatings, ceramics, plastics and enamels）
S−11−−−Taber Resurfacing Disc（150 grit abrasive paper, typically used for refreshing resilient wheels.100 mm diameter with a 6.35 mm center hole, 100 pcs）
BGD 522/J−003−−−Working Platform for wood abrasion
BGD 522/J−040−−−Fixing ring for soft specimen.
BGD 522/Z−001−−−180 # Emery cloth stripe（pack of 100）
BGD 2601−−−Glass Panel with circular hole（pack of 100）
BGD 2328−−−Aluminum Panel with circular hole（pack of 100）
BGD 2339−−−Standard Zinc Panel for calibration（pack of 10）



Standard abrasive rubber wheel



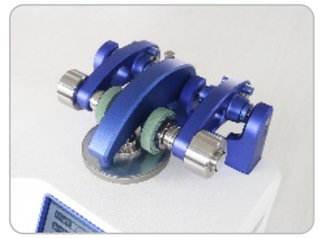
S−11 Taber Refacing Disc



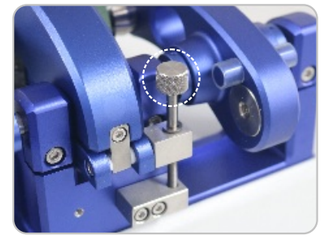
precise stainless steel weights



A Quick Release Mounting Hub permits quick wheel mounting without the need of a locking nut.



Abrading arms and fixing sleeve of abrading wheel hav been calibrated and balanced before leaving factory.



A precision vacuum nozzle adjustment control allows the height to be modified for accommodating varying specimen thickness.

⑤ Eraser & Alcohol Dual-purpose Abrasion Tester

For 3C products including mobile phones, tablets, laptops, earphones, etc., their housing coatings （plastic UV coatings, PU coatings, metallic IML, anti-fingerprint coatings, etc.）are subject to frequent hand contact, routine cleaning or pocket friction by end consumers. This may cause defects such as worn-off printed characters or logos on coating surfaces, scratches, whitening, substrate exposure, gloss loss and hazing.

The alcohol abrasion test simulates daily disinfection and cleaning of such products with alcohol, to assess the coating?s resistance to erosion by alcohol-based chemicals.

The eraser abrasion test simulates continuous friction conditions during product storage and usage, to evaluate the scratch resistance and wear resistance of coatings. These two indicators jointly guarantee the long-term surface integrity of products.

- ◆ Dual rubbing head design, enabling alcohol abrasion test and eraser abrasion test to be carried out simultaneously.
- ◆ The test rod fitted with rubbing heads can be adjusted vertically to change the distance from the worktable, accommodating test panels or workpieces of different thicknesses.

Main Technical Parameters：
★ Weights: 2 pcs each of 50 g, 250 g, 500 g; 4 pcs of 100 g
★ Maximum load capacity of worktable: 5 kg
★ Adjustable moving stroke of rubbing head: 0–100 mm
★ Adjustable test downforce load: 100 g–1000 g
★ Rubbing speed: stepless speed regulation, 0–95 cycles per minute
★ Overall dimension (L × W × H): 510 mm × 400 mm × 300 mm
★ Power Supply：110V~220V, 50Hz&60Hz
★ Net weight of machine: 23 kg
★ **Ordering Information:**
BGD 524S––Eraser & Alcohol Dual–purpose Abrasion Tester
BGD 1361––EF 74 Special Eraser for Abrasion Test (12 pieces per box)



⑥ Abrasion Resistance Tester for Touch Screen Coating

Introduction: In view of intelligent electronic products are more and more widely used, it is a very important issue for coating experts to solve how to give customers a great touch experience and how to resist the dust and scratch caused by fingerprint. American Society for Testing and Materials (ASTM), Coatings and Related Materials and Applications Committee (D01) have published the new international standard, which is the test method for abrasion resistance of touch screen coatings on intelligent electronic products. In 2021, ASTM D8380-21 *Standard Test for Dry Abrasion Resistance of Hydrophobic and Omniphobic Coatings* was issued. The standard specifies a method for testing the abrasion resistance of hydrophobic and omniphobic coatings, which are usually used to enhance the fingerprint resistance, water removal, stain resistance and easy cleaning performance of the coating surface. By comparing the difference between the initial contact angle and the contact angle after mechanical abrasion, to evaluate the function of coating that maintain its original properties after environmental exposure.

According to this newly promulgated standard, BIUGED INSTRUMENTS develops a new instrument——**BGD 537 Abrasion Resistance Tester for Touch Screen Coating.**

The tester adopts Single-Chip Microcomputer control system, which has the characters of stepless speed, automatic counting. The Touch screen directly displays working speed, counts, and can be set the test times. With the features of compact structure, easy-to-operate, and good repeatability&comparability of test results, it is the first choice for research and production of hydrophobic coatings and intelligent electronic product testing institutions.

Main Technical Parameters：
★ Rubbing Distance: 30mm ± 1mm
★ Rubbing Frequency: 5 ~ 95 times/min.（stepless）
★ Rubber Head Load: 10N ± 0.5N
★ Rubber Head Size: (10 ± 1)mm × (10 ± 1)mm (1.0cm^2 in area)
★ Rubber Medium: 0000#Steel Wire Brush
★ Settable Rubbing Times: 0~9,999
★ Power Supply: AC 110 ~ 220V; 50 ~ 60 Hz
★ Overall Size: 350mm × 375mm × 305mm（L × W × H）
★ Gross Weight: 16.7 kg
★ **Ordering Information:**
BGD 537––Abrasion Resistance Tester for Touch Screen Coating



⑦ Falling Sand Abrasion Testers

BGD 529 Falling Sand Abrasion Tester is designed according to ASTM D968. It's applicable to determine abrasion resistance performance of organic coating. Abrasive is allowed to fall from a specified height through a guide tube onto a coated panel until the substrate becomes visible. The amount of abrasive per unit film thickness is reported as the abrasion resistance of the coating on the panel.

- ◆ Funnel with fan-shaped switch is more convenient to operate
- ◆ The distance between guide tube and specimen holder is calibrated by special tool which comes with tester, more precise.
- ◆ Funnel installation height can be adjusted freely by below bearing.

Main Technical Parameters：
★ Overall dimensions：230 × 200 × 1500mm（L × W × H）
★ Length of conduct pipe：36 inch（914mm）
★ Inner diameter：0.75 inch（19mm）
★ Volume of hopper：3L
★ Weight of whole machine：25kg
★ **Ordering Information：**
BGD 529––– Falling Sand Abrasion Tester
BGD 529/W–009––– Standard Sand (15kg/package)





⑧ R.C.A. Paper Abrasion Wear Testers

BGD 530 R.C.A Paper Abrasion Wear Testers have been designed to test numerous shapes and finishes with ease and consistency. A simple change to the adjustable vertical shaft will allow for testing flat, convex, and concave shaped surfaces. They can be used to test painted and organic finishes, foil, and inked keypad lettering for resistance to abrasion and wear. These testers have become a standard in automobile, appliance, electronics, cell phone, plastics and coating industries.

International：ASTM F2357-04, Standard test method for determining the abrasion resistance of inks and coatings on membrane switches using the Norman Tool, Inc. "RCA" Abrader.

This tester is a standard to the auto, appliance, cell phone, plastics, and coarint industries. It uses an inexpensive roll of throw away abrasion paper. All build-up error is eliminated and consistent readings are easily obtained.

Main Technical Parameters：
★ Weights：55g, 175g, 275g, suitalbe different soft material or different test methods（Note：standard weight is 275g when there is no loss weight on lever, it would be changed to 175g or 55g when adding two loss weights）
★ Counter：Rotary counter
★ Paper moving speed：2670mm/min.（157mm for one cycle）
★ Rotating Speed：（17 ± 2）cycles/min.
★ Power：220V 50Hz
★ Overall Size：800mm × 300mm × 380mm（L × W × H）
★ Net Weight：12 kg
★ RCA Paper：17.46mm width, the total length is 250m for one roll（1800 cycles）
★ **Ordering Information:**
BGD 530–––R.C.A Paper Abrasion Wear Testers
BGD 1360–––Special R.C.A Paper（40 rolls/box）





Tensile Machines

The Tensile Machine is also called Tensile Testing Machine or Universal Material Testing Machine. It is mainly used for tensile test (you also can call it stress-strain tester), they usually clip both ends of the material sample in two clamps which are in a certain distance apart, both of clamps separate and extrude the sample at a certain speed, testing the stress change which happens to the sample, and end of the test until the machine destroyed; recording the maximum and displacement during the test at the same time, so you can calculate the tensile strength, shear strength, peeling strength, yield strength, ring crush strength etc through the software. The tensile test is one of the most widely used methods in studying material mechanical strength, and it needs to adopt the constant speed.

In the present market , the tensile machine has mostly been adopted the design of electromechanical integra-tion, which is consist of Main Part, Mechanic Part, Hydraulic System, Force Measuring System etc, the Force Measuring System is made up of Force Sensor, Transmitter, Microprocessor, Load-driving Mechanism and Computer.

Users can choose the appropriate tensile machine according to the size of the sample and the material characteristics. For example, the small volume and tensile for choosing: tensile machine (Single Column). But with big size and tensile, the tensile machine (Double Column) should be used, the processing of common tensile machine is about 600mm.

In the coating industry, waterproof coatings, floor coatings, building coatings with elasticity, putty for internal and external walls and some industrial coatings must be tested for their bonding strength with substrates by tensile machine, and elongation at break of coatings. But compared with plastic, rubber, metal and other materials, its force value and elongation are much less.

① Computer Servo Tensile Machine

Introduction: Computer Servo Tensile Machine is a new type of material machine which combines the electronic technology and mechanical transmission. It can make all kinds of function true, do the data analysis and print the test result by computer controls the operation of machine. The communication between machine and computer usually adopts USB interface. It has wide accuracy acceleration and test force range, not only measuring and controlling the load and displacement in higher accuracy and sensitively, but also doing the control test by automatically of isokinetic load and displacement. It operates easily and conveniently, especially applied in inspect instruments which is used for controlling products of produce line. This series of Servo Tensile Machines is mainly suit for nonmetal and metal test with test load less than 10KN.

These machines have a wide usage range, can test all sorts of materials, such as end products and semi-manufactures dumbbell specimen of plastic (cloth tube plate), rubber (plate tube), metal wire, tape, wheel, textile, acrylic, FRP, EVA, PE and shoes etc, testing their functions which include tensile strength, elongation, tearing, stripping, glue force etc.

Characteristics:

- Standards: ISO 37, ISO 527, ISO 1421, ASTM D412, ASTM D638, ASTM D903, ASTM D2370, EN 12311, JIS K 6251
- Sensor with high accuracy（transmission mechanism adopts high accuracy ball screw）
- Sampling frequency of Data: 200 times/s
- It can storage numerous testing results of reference points, counting the average and grasping the Max which exist on the point of broken by automatically.
- The setting range of broken proportions: 0~99%, you can set it according to the test demand of different specimen at you will, make the downtime true on different point.
- Safety set: Overload, urgent downtime set, up and down process limited set.
- The collection with synchronous puts into practice by true, 24 bites AD transformed, resolution is up to 1/500,000, and it oversteps the same industry level absolutely.
- Thousands of clamps and clamps set for choosing.
- With several sensors supported, it can satisfy with different range demands by assembling several sensors at the same time.
- User can calculate elastic modulus, yield point, constant residual strength, constant elongation, constant force deformation and maximum strength. There are other special professional calculations, such as the calculation of belt stripping and the elongation at yield point.

- Optional measure and control system of professional test machine, which can realize the closed loop of force value, deformation and position, so that the tensile machine can carry out curve control tests freely, such as low frequency cycle (fatigue) test, step test and force value holding (creep) test.

Measure and Control System→ Function ↓	Standard open-loop control system （standard configuration）	Standard close-loop control system （optional）
Position (displacement speed)	√	√
Force（force value speed）	×	√
Deformation	×	√
Multiple Control （position, force, deformation control exchange）	×	√
Cycle control	×	√

Software:

- Operating interface attached with graph, image: intuitive and convenient to use, and it will decrease the operation error by voice mentioned, improving the reliability at the same time.
- MS-ACCESS database technology and SQL technology: it is not only applied for data preservation and processing standardization, but also convenient for connecting to Intranet or Internet. It can also connect Word or Excel etc software easily. User can read original test data just through standard database.
- Modular programming VBScript can enlarge the user s reporter and parameter program by automatic calculation. User can develop by secondary, it can realize stretching, compression, bending, tearing, stripping, shearing etc test functions except for software bag.
- The curve graph function: through modular programming, real-time curve graphs will be displayed during the test, and parameter types can be selected for the coordinate axis of curve graphs. In theory, there are 169 kinds of graphs, from which parameters can be displayed.
- Multi-sensor support: it can support 5 force value sensors, 5 deformation sensors + large deformation + displacement, which expanded the test range greatly.

NOTE: The minimum requirements of PC Windows 7/Windows 8/Windows 10 operating system, USB2.0/ USB3.0 interface, CPU 3.0 GHz, 4 GB of memory, 100 GB of hard disk, wide screen color display the minimum resolution: 1366×768.



BGD 573



BGD 574

Ordering Information → Technical Parameters ↓	BGD 573 Computer Servo Tensile Machine (Single Column)	BGD 574 Computer Servo Tensile Machine (Double Column)
Power system	Fuji servo machine	
Max. range (optional)	50N, 100N, 200N, 500N, 1KN, 2KN	50N, 100N, 200N, 500N, 1KN, 2KN, 5KN
Convertible Units	g, kg, n, lb (supply with three units which include international standard, metric, inch, they can convertible by automatically)	
Measuring Range of Test Force	1% ~ 100 FS (full range)	
Display Error of Test Force	≤ ±1%	
Resolution of Test Force	1/500,000	
Resolution of Displacement	0.015μm	
Displacement Display Error	≤0.2%	
Max. Space of Tension	800mm (clamp is not included)	
Test Speed	0.01–500mm/min (stepless speed regulating)	
Valid Test Wide	Unlimited	300mm
Overall Size（L×W×H）	450mm×550mm×1350mm	600mm×420mm×1250mm
Weight	100 kg	155 kg
Power supply	220V/50Hz；15A or designation	
Power	400W	400W

Optional Accessories

BGD 570/K---Low temperature tensile test chamber

BGD 1530---Bond strength pulling head （40mm×40mm）

BGD 1531---Bond strength pulling head （50mm×50mm）

BGD 1550/A---Elongation Device（Also call big deformation device, measure breaking elongation, see NOTE)

BGD 1551---Tensile small range sensor（≤ 500 kg）

BGD 1552---Tensile big range senso（≥ 500 kg）

BGD 1553---Pneumatic Cutting Machine （Used to cut different type samples）

BGD 1554---Cutter for dumb-bell sample（For tensile strength）

BGD 1555---Cutter for right angle tear sample（For tear strength）

BGD 1700----Plane clamp

BGD 1701----Eccentric wheel clamp

BGD 1702----Wedge clamp for metal

BGD 1703----Wedge clamp for hard plastic

BGD 1704----Film clamp


BGD 1551


BGD 1552


BGD 1553


BGD 1550


BGD 1554


BGD 1555


BGD 1530


BGD 1700


BGD 1701


BGD 1702


BGD 1703


BGD 1704

Notice: About the Elongation of Tensile Machine

The tensile machine attached with displacement measuring system is just used for measuring the cross distance of tensile head. If there is a required to the elongation, such as testing elongation of rubber products, thus another requirement is necessary with large-deformation test frame and large-deformation extensometer, if the metal with small elongation, small-deformation extensometer is enough(metal extensometer). Large-deformation and small-deformation is the absolute displacement between two points during the extruding. You can pick up the machine according to your company products size, the small volume and tensile for choosing: tensile machine (single column). But with big size and tensile, the tensile machine (Double Column) is indeed, the processing of common tensile machine is about 600MM.

② Universal Material Testing Machine

Introduction: BGD 570/571 Universal Material Tensile Machine is a new type of material machine which combines the electronic technology and mechanical transmission. It has wide accuracy acceleration and test force range, not only measuring and controlling the load and displacement in higher accuracy and sensitively，but also doing the control test by automatically of isokinetic load and displacement. It operates easily and conveniently，especially applied in inspect instruments which is used for controlling products of produce line. This series of tensile machine is mainly suit for non-metal and metal test with test load less than 20KN（BGD 570）or 50KN（BGD 571）.

The electronic universal material testing machine is mainly suitable for testing metal and non-metal materials, such as rubber, plastic, wire and cable, optical fiber cable, seat belt, safety belt, leather belt composite material, PVC, waterproof coiled material, steel pipe, copper material, section bar, spring steel, bearing steel, stainless steel （and other high hardness steels）, castings, steel plates, steel belts and non-ferrous metal wires. To test their functions which include stretching, compression, bending, shearing, stripping, tearing, two-point extension（additional extension meter is required）etc.

Features:

◆ Standards: ISO 37, ISO 178, ISO 527, ISO 604, ISO 1209, ISO 1421, ASTM D412, ASTM D638, ASTM D903, ASTM D 2370, EN 12311, JIS K 6251

◆ High precision sensor（use high precision ball screw as driving mechanism）

◆ Frequency of collecting data: 200 times/second.

◆ Can store many testing results of referenced points, calculate average value automatically, grab automatically max. Value, force value at break.

◆ Set range of break point proportion: 0~99%, and can set freely according to different samples, accomplish stopped status at different position.

◆ Safety Device: Over loading, Emergency shut down, limitation device for above travel and under travel.

◆ Collect date synchronously, conversable full 24 bits AD codes, resolution arrives 1/500,000, surpass all competitors.

◆ More than one thousand clamps and grippers for selection.

◆ Support multi-sensors, can equip with a few sensors at the same time for different range.

◆ User can calculate elastic modulus, yield point, constant residual strength, constant elongation, constant force deformation and maximum strength. There are other special professional calculations, such as the calculation of belt stripping and the elongation at yield point.

◆ Optional measure and control system of professional test machine, which can realize the closed loop of force value, deformation and position, so that the tensile machine can carry out curve control tests freely, such as low frequency cycle （fatigue）test, step test and force value holding（creep）test.

Measure and Control System→ Function ↓	Standard open-loop control system （standard configuration）	Standard close-loop control system （optional）
Position (displacement speed)	√	√
Force（force value speed）	×	√
Deformation	×	√
Multiple Control （position, force, deformation control exchange）	×	√
Cycle control	×	√

Software

◆ Operating interface attached with graph, image: intuitive and convenient to use, and it will decrease the operation error by voice mentioned, improving the reliability at the same time.

◆ MS-ACCESS database technology and SQL technology: it is not only applied for data preservation and processing standardization, but also convenient for connecting to Intranet or Internet. It can also connect Word or Excel etc software easily. User can read original test data just through standard database.

◆ Modular programming: VBScript can enlarge the user s reporter and parameter program by automatic calculation. User can

develop by secondary, it can realize stretching, compression, bending, tearing, stripping, shearing etc test functions except for software bag.

◆ The curve graph function: through modular programming, real-time curve graphs will be displayed during the test, and parameter types can be selected for the coordinate axis of curve graphs. In theory, there are 169 kinds of graphs, from which parameters can be displayed.

◆ Multi-sensor support: it can support 5 force value sensors, 5 deformation sensors + large deformation + displacement, which expanded the test range greatly.

NOTE: The minimum requirements of PC: Windows 7/Windows 8/Windows 10 operating system, USB2.0/ USB3.0 interface, CPU 3.0 Ghz, 4 GB of memory, 100 GB of hard disk, wide screen color display（the minimum resolution: 1366×768）.



Optional

Optional Accessories

BGD 570/K---Low temperature tensile test chamber

BGD 1530---Bond strength pulling head （40mm×40mm）

BGD 1531---Bond strength pulling head （50mm×50mm）

BGD 1550/B---Elongation Device（Also call big deformation device, measure breaking elongation, see NOTE）

BGD 1551---Tensile small range sensor （≤500 kg）

BGD 1552---Tensile big range senso （≥500 kg）

BGD 1553---Pneumatic Cutting Machine（Used to cut different type samples）

BGD 1554---Cutter for dumb-bell sample（For tensile strength）

BGD 1555---Cutter for right angle tear sample（For tear strength）

BGD 1700----Plane clamp

BGD 1701----Eccentric wheel clamp

BGD 1702----Wedge clamp for metal

BGD 1703----Wedge clamp for hard plastic

BGD 1704----Film clamp



BGD 1700　BGD 1701　BGD 1702　BGD 1703　BGD 1704

NOTE: About the elongation of test materials

The displacement measure system，which is contained in tensile machine，only measures the moving distance of the crossbeam. If you need to measure the elongation of materials，such as elastic coatings or rubber products，additional large deformation device is required.

Hardware

◆ Three-way independent simulant input channel, 24 bits AD converter, gain amplifier controlled by program.

◆ Use USB 2.0 insulated photoelectricity to connect computer, reduce disturb and increase reliability.

◆ Unit for testing force uses the newest high-speed, high resolution, high precision, no dividual grade AD converter which can arrive ±500,000 fractionized codes. It's superior to six grades amplifier and reach or approach advanced international standards.

◆ Unit for testing big distortion: this system use high-speed circuit system to accomplish four-quadrant collection of photoelectric encoder, solve all influence to testing results because of dithering under low speed and redirection thoroughly, and increase four times resolution to big distortion of test machine big distortion.

◆ Unit for testing displacement: use high-speed circuit system to accomplish four-quadrant collection of photoelectric encoder, solve all influence to testing results because of dithering under low speed and redirection thoroughly, and increase four times resolution to big distortion of test machine big distortion.

◆ Unit for controlling speed: full digital controlling unit and its speed regulation ratio arrive 1:500000, namely 0.001~500mm/min（precision : 0.1%）, and can be tested under the whole range.

Ordering Information → Technical Parameters ↓	BGD 570 Universal Material Tensile Machine	BGD 571 Universal Material Tensile Machine
Max. range (optional)	100N, 200N, 500N, 1KN, 2KN, 5KN, 10KN, (can be extended to 20KN)	50N, 500N, 5KN, 10KN, 20KN, 50KN
Precision Grade	Grade 1	
Measuring Range of Test Force	1%～100 FS（full range）	
Display Error of Test Force	Within±1%（indicating value）/ Within±0.5%（indicating value）	
Resolution of Test Force	±1/500,000 of max. force（There is no grade in the whole process, and keep the constant resolution throughout the whole process.）	
Load Sensor	Standard configured one tension and pressure sensor（maximum load）; Up to 5 sensors can be added.	
Valid Test Width	380mm	450mm（can be widened as required）
Valid Tensile Space（excludes clamp）	1100mm（can be lengthen as required	1000mm（can be lengthen as required）
Test Speed	0.001–500mm/min	0.01–400mm/min
Display Error of Displacement	Within±0.5%（Indicating Value）/ Within±0.2%（Indicating Value）	
Control System of Deformation（Optional）	A. Large deformation measure system: the minimum gauge distance is 10mm, the deformation range is 800mm. B. Small deformation measure system: gauge distance: 25mm, 50mm, 100mm; deformation range: 5mm, 10mm, 25mm	
Control Accuracy of Deformation Speed	Within±0.5% of indicating value（large deformation or small deformation can be selected by customers）	
Safety Device	Electronic limit protection	
Lifting Device of Working Platform	Fast/slow speed automatic control, can move by yourself	
Return Function	Manual or automatic. After the test is completed, it returns to the initial position at the highest speed.	
Overload Protection	If the maximum load exceeds 10%, the machine will be automatically stopped.	
Clamp	A set of clamp（special clamps can also be designed according to the customers sample specifications.	
Overall Size（L×W×H）	700mm×530mm×2200mm	880mm×530mm×1800mm
Power System	Servo machine + ZNT high accuracy ball screw	Servo machine + transmission + high accuracy ball screw
Power Supply	220V，50HZ	
Weight	300 kg	380 kg
Power	0.4kW	1.0kW

Special Instruments For Ink and Printing

Hand Proofer

Each Biuged Hand Proofer mainly includes a rubber transfer roll and a spring-adjustable mechanically engraved anilox roll（Pyrimid type/surface is hard chrome plated）. It gives customers more options for testing ink on polyethylene, cellophane, glassine, metallic foils, plastic films, paper and paperboard.

Moreover, what you see on the proof is what you'll print on press. Since proofer rolls are available in a full range of screens to duplicate your press requirements, you can make any changes in ink or screen before you get to the pressroom!

Features:

- The newest structure design, simple and easy to use, convenient to clean
- Perfect reproducibility for ink applicationo，can reappear ink density
- The pressure between anilox roller with rubber roller is adjustable
- Save ink and time before printing

How to produce a sample proof

- Prepare a flat, clean sheet of the stock to be used.
- Adjust the anilox roller against the rubber roller by gradually turning the single vernier knob at the base of the hand proofer. a spring mechanism inside the handle makes it simple to position the rollers to get just the right amount of pressure.
- Put about 1/2 teaspoon of ink in the nip, rest the rubber roller on the stock, and draw the hand proofer toward you, smoothly and evenly.

That's all there is to it. what you see on the proof is What you'll get on Your flexo press.

Main Technical Parameters：

★ Proofing width：70mm

★ The number of line：120～300（LPI/Lines per inch；also can be customized）





Ordering Information		Line Screen Per Inch（LPI）	Line Screen Per Centimeter（LPC）	Volume（BCM/in²）	Volume（cm³/m²）
Hand Proofer	Anilox Roller only				
BGD 220/1	BGD 220/W–005	120	47.24	12.79	19.823
BGD 220/2	BGD 220/W–006	160	62.99	9.32	14.446
BGD 220/3	BGD 220/W–007	180	70.87	8.24	12.767
BGD 220/4	BGD 220/W–008	200	78.74	7.28	11.292
BGD 220/5	BGD 220/W–009	250	98.43	5.45	8.454
BGD 220/6	BGD 220/W–010	300	118.11	4.44	6.889
BGD 220/W–002–––– Rubber Roller					

Note:

1. This table is only available for Pyramid type
2. For Line Screen, divide Cell (LPI=Line Per Inch) count by 2.54 to get Lines per CM
3. For Volume,multiply BCM（billion cubic micron per square inch）by 1.55 to get cm^3/m^2

Printing Proofer

High quality proofs using gravure, gravure-offset or flexo inks are produced instantly using the BGD Printing Proofer. Featuring electronically engraved printing plates and variable printing speeds of up to 45m/min, this is an essential tool for all those involved in the manufacturing or use of liquid inks. Ideal for R&D and computer colour matching data, quality control and presentation samples. And these Printing Proofers are very easy to clean and all parts are solvent resistant.

- Almost any flexible substrate can be printed or laminated
- Excellent printability ensured by micrometer control
- Multiple ink samples may be printed simultaneously for comparison purposes
- High printing speeds enable use of inks nearing press viscosity

Ordering Information → Parameter ↓	BGD 622/1	BGD 622/2
Applicable for	Gravure Ink	Flexographic Ink
Motor Power	120W	120W
Impression roller	ϕ76×130mm	ϕ50×130mm
Roller Hardness	Shore A 55	Shore A 50
Printing Speed	Four sorts：20–30–40–45m/min	Four sorts：20–30–40–45m/min
Printing Length	150mm	150mm
Power	220V 50Hz	220V 50Hz
Overall Size (mm)	500×425×350	500×425×350
Weight	26 kg	27 kg



BGD 622/2



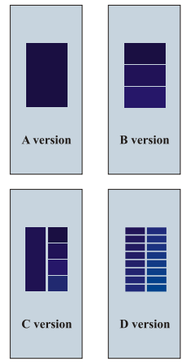
BGD 622/1

Printing Plate

Printing plates for use with the Printing Proofer are electronically engraved in exactly the same way as production cylinders. A choice of one or more of the standard plates available will normally be satisfactory.

TYPE	Number of Lines（Lines/inch）	Density（%）	Remark
A1	150	100	Solid Area Plate
A2*	100	100	
B1	150	100–80–60	Single 3 Wedge Plate
B2*	150	100–90–80	
C1	150	100–90–80–70; 90	1+4 Wedge plate
C2*	300	100–90–80–70; 90	
C3*	175	100–90–80–70; 90	
C4*	175	80–60–40–20; 100	
D1	150	100–95–90–85–80–75–70–60 100–95–90–85–80–75–70–60	Double 8 Wedge Plate
D2*	150	40–35–30–25–20–15–10–5 80–75–70–65–60–55–50–45	

Note: “*” are special plates and need custom-made



Multi-section Ink Printing Proofer

BGD 626 Multi-section Ink Printing Proofer is the newest product used for the testing the adaptability of ink printing. Compared with other types, it has many features as below:

- Distribute ink automatically and time and speed for distributing ink are adjustable.
- Used for lithography printing,letterpress printing or UV ink, UV flexographic ink
- Printing pressure and printing speed can be set according to the user's requirements.
- Can print different substrates,such as book paper, art paper,matt art paper, gray paperboard,film and tinplate etc.
- High repeatability and reproducibility.
- High quality, easy to clean and maintenance, simple and safe for operation.

Main Technical Parameters：
★ Effective size of coloured strips：106mm×215mm（two colours）；106mm×215mm/45mm×215mm（three colours）；45mm×215mm（four colours）
★ Printing Rubber：Common rubber or special rubber for UV ink （either–or）
★ Speed of distributing ink：There are three different speeds （550,700,900 rpm）on the control board.Operator also can dismantle shell of machine to do stepless speed regulation.
★ Printing speed：There are three different speeds （10,16,22 rpm）on the control board.Operator also can dismantle shell of machine to do stepless speed regulation.
★ Distributing ink time：1～120 second (adjustable)
★ Print pressure：Can be adjusted precisely externally according to the substrate thickness（±0～800g）
★ Distributing ink pressure：Can be adjusted precisely externally according to the rubber using status
★ Power supply：AC 220V/50Hz；Power：250W（saving electrical power design）
★ Dimensions of machine：525mm×430mm×280mm
★ Weight：75 kg
★ **Ordering Information:**
BGD 626––– Multi–section Ink Printing Proofer
BGD 1145––– Ink Injector
BGD 1386––– Special roller for UV ink





Note:
Ink Injector is used for compare ink and its colour, operator can control precisely thickness of coloured striped when printing. And also can get the dosage of spot colour ink in advance by calculation. Its size is φ20X180mm and min quantitate unit is 0.00112CC

Falling Rod Viscometer

This unit is designed to measure the time it takes for a precision rod to fall 10cm. After several "fall times" are measured, the viscosity and yield value of the ink can be calculated by using the software included with the instrument or by using your own technique. This test conforms to ASTM D4040-10 and ISO 12644 . "Standard Test Method for Rheological Properties of Paste Printing and Vehicles by the Falling-Rod Viscometer"

The basic system consists of the instrument stand, road and collar, and a 100 gm weight.

Main Technical Parameters：
★ Falling rod size：φ12mm×300mm
★ Falling rod weight：132g　　Timing precision：0.01s
★ Viscosity range of interest：2–200Pa.s（Non–newtonian fluid）
★ Mass of the weight load：25–50–100–200–200–500–1,000 –1,000g (total 4075g)
★ Overall Size：140mm×140mm×300mm　　Package Weight：18 kg
★ Power Supply：220V 50Hz
★ **Ordering Information:** BGD 611––– Falling Rod Viscometer





Intelligent Inkometer

Each type of ink has a different tack（viscosity） and this is why it is important to measure the tack of the ink. After all, this determines how an ink behaves on the press. How much force is required to distribute the ink over the roller evenly and is the ink suitable for specific types of paper? Too much tack could loosen fibers on the surface of the paper. It is also important for the correct color sequence on the printing press. With a four color press the tack value of the inks on consecutive towers of the press will have to be slightly less in order to prevent the last ink layer from pulling the previous ink layer from the paper.

BGD 615 Intelligent Inkometer is designed to measure the apparent tack of printing ink under conditions closely approximating the dynamic conditions of the ink-distribution system of a printing press. It also can measures the integrated forces involved in ink film splitting and the effects of roller speed, film thickness, temperature and solvent evaporation.

This Inkometer consists of three rollers: The center roller is a temperature controlled brass roller; The bottom roller is an oscillating rubber composition distribution roller; The top roller is a rubber composition roller attached to the measuring system which measures tack. And all rollers are available for testing standard and UV inks. The brass roller temperature is controlled by circulating a coolant mixture provided by a thermostatic bath.

Features：

- The tack is reported in 0.1 gram-meters and represents the torque required to "work" the ink film at a known rate with predetermined film thickness and temperature.
- With big digital display shows the temperature, tack, roller speed and test time. Statistical reports can be viewed directly from the display.
- Highest accuracy and efficiency.



Main Technical Parameters：
★ Brass roller speed range: 400 RPM, 800 RPM, 1200 RPM, 1600 RPM, 2000 RPM; Additional: Roller Testing Speeds – Programmable 100 to 2000 RPM（3000 RPM Optional customized）
★ Brass Roller Lateral Error: ± 0.03mm after leveling on workbench .
★ Roller Speed Accuracy: ± 2 RPM
★ Thermostatic Bath Pump Flow: 10L/minute （Bath capacity：8L）
★ Temperature Error: ±0.1℃
★ Display Resolution: 0.1 unit of ink viscosity
★ Testing Accuracy: ± 0.3 unit of ink viscosity （same testing condition）
★ Printing: Testing time, number, temperature, speed, viscosity values
★ Accessory: With a piece of ink injector which is very easy to dismantle and install.
★ Power Supply : 220 V, 50/60 Hz
★ Total Power: 1600W （motor 800W, water tank 800W）　　Noise：≤50 db
★ Dimensions: 750mm×300mm×480mm　　Net weight: 130 kg
★ **Ordering Information:** BGD 615––– Intelligent Inkometer
BGD 1384––– Special Roller for UV Ink

Rub Resistance Tester

BGD 630 Rub Resistance Tester is applicable in rub abrasion resistance test of printing works, light sensitive layer of PS boards, and coating layers of relative products. It can help users to analyze the affairs of lower abrasion assistance, ink layer falling-off, lower printable of PS boards, and rigid of coating layers of other products.

- Wide voltage range design (110-220V； 50/60Hz), good compatibility
- Adjustable variable speed: 5~150 c.p.m
- Touch screen control, display and set testing paramters.
- Parameters set freely and permanently storage.
- Control and resolve the problems of low bad abrasion resistance and easy falling-off of ink layer of printing works.
- By test, controls production technique efficiently, avoids loss of goods returns caused by bad quality.
- The specimen's coating and receptor rub each other under specified speed and pressure load. Determine the abrasion of coating or ink layer by testing the decrement of coating concentration or decrement of coating thickness.

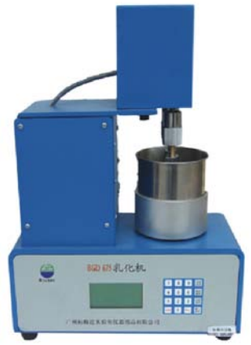
Main Technical Parameters：
★ Motor Power：50W; AC 110V~220V; 50Hz/60Hz
★ Rubbing Pressure：10 N ± 0.1 N （abrasive head,1pc）; 10 N ± 0.1 N （additional weight,1pc）
★ Rubbing Speed：（5–95) times/min.(stepless speed regulation)
★ Rubber Pads Size：25mm × 50mm × 8mm（L × W × H）
★ Rubber Pads Hardness：50Hs ~ 53Hs
★ Rubber Medium：80g/m² clean coated paper, the width is 50mm
★ Rubbing Distance：60mm（Special rubbing distance,such as 100mm,120mm and 155mm can be customized）
★ Settable Rubbing Times：0~9,999
★ Suitable Specimen Size：300 mm （L）× 60 mm （W）
★ Power Supply：AC 110V ~ 220V; 50Hz ~ 60 Hz
★ Overall Dimension：350mm × 375mm × 305mm （L × W × H）
★ Weight：16.7 kg
★ **Ordering Information:** BGD 630–––Rub Resistance Tester



Digital Emulsification Tester

BGD 675 Emulsification Tester is used to test fleetly the water demand of hectograph ink and its binder in laboratory. And it complies with ASTM D4942.This instrument use double-frame stirrer rake through planetary stirring, with shearing, dispersion action, the non-dissolve liquid are dispersed and minimized. These liquid flow in the container circularly and achieve uniform emulsification situation. It is controlled by programmable controller and can show the working situation and parameters. This Instrument has such advantages as newest design, steady working, accurate measurement, high reliability and easy operation.

Main Technical Parameters：
★ Power Supply：AC220V 50HZ
★ Stirring Rotating Speed：90/100/150 r. p. m
★ Container Size（Inner Diameter × Height）：100 × 100mm
★ Stirrer Rake Size（W × H）：56mm × 100mm
★ Overall Size：330mm × 150mm × 460mm
★ Weight：20kg
★ **Ordering Information:** BGD 675–––Digital Emulsification Tester



Automatic Drying Tester for Ink

Automatic Drying Tester for ink is applicable to test the ink drying time. This tester consists of a rotating cylinder, a weight wheel and touch screen. When it work, the rotating cylinder rotates at constant speed, meanwhile the weight wheel moves in line along the cylinder axis at the constant speed. Applicate the sample on the parchment（film length is 30cm）, then stick the parchment on the rotating cylinder. Move the weight wheel to the starting point（cylinder left）and set the needed time（from 5hours to 20 hours）which it go over the whole distance（the length of cylinder）.If the ink don't dry completely, then the weight wheel would leave a mark on the parchment blank space, till the test is finish. Obtain the test results by counting the ink traces on the parchment and rotating cylinder working speed.

Main Technical Parameters：
★ Power：220V ± 22V 50Hz
★ Speed of weight wheel：2mm/r
★ Settable time of whole distance：5~20（hour）
★ Circle Numbers of Whole distance：120r
★ Overall dimensions：500mm × 200mm × 220mm（L × W × H）
★ Wheel weight：100g
★ Weight：17 kg
★ **Ordering Information:**
BGD 660–––Automatic Drying Tester for ink



Surface Tension Test Pens （Dyne Test Pens）

Surface tension test pens were introduced to give an accurate measurement of graduated surface tension levels. The fluid is applied to the surface or substrate until a satisfactory dyne level is found.

Experience has shown that wetting is normally adequate when a continuous film of test fluid remains intact for 2 seconds. Breaking of the fluid into droplets in less than 2 seconds indicates a lack of wetting and a lower numbered test fluid should be tried. If the fluid remains intact for longer than 2 seconds, a higher numbered test fluid should be tried.

A clean, new cotton applicator should be used each time to avoid contamination of the solutions ensure the film surface is not touched or contaminated in the areas in which the tests are to be made.

These pens are widely used in PS, PE, PP, PET, PI, PC, NY, CPP, OPP, PVC etc.

Biuged offer 16 sorts different dyne value pens（30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60 dyne）.Please select the correct type when ordering.

Procedure:

- Draw with a pen on the test area of about 1 inch
- Check the time how long it takes the ink changes to small drop or makes peripheral shrinkage.After 2 seconds, there is nothing change, repeat the test with higher dyne pen.
- Suitable dyne is that takes 4 seconds till the ink changes to small drop or makes peripheral shrinkage.
- Surface energy should be more 10 dyne than ink, adhesive, coating.
- When the liquid drops in the surface of material, if surface energy of material is lower than surface energy of ink, the ink uniformly spread on the surface.
- On the contrary to this, if surface energy of material is bigger than surface energy of ink, the ink uniformly spread on the surface.

★ **Ordering Information:**

BGD 1146–––Surface Tension Test Pens (5ml)

BGD 1147–––Surface Tension Test Pens (12ml)



Universal Instruments of Laboratory

Precise Digital Overhead Stirrer

These newest stirrers are of the highest quality. The core a direct current brushless motor is explosion-proof and overcomes the disadvantages of traditional stirrers. The stirrers can operate under high load for an extended period of time without any need for maintenance.

Features:

- High reliability and outstanding performance.
- LCD display for precise monitoring of set and actual speeds, a wide range of speed from 50 to 2200rpm with control accuracy of±3rpm (BGD 702&BGD 704&BGD 706).
- Brushless DC motor for long life, maintenance free and explosion proof Torque trend display for real-time information on viscosity changes.
- Safety circuits allow for safe stop function in anti-stall or overload conditions.
- Smooth operation prevents accidental spillage and splashing.
- Provides constant speed even with changes in viscosities of the samples.
- Remote function provide PC control and data transmission.
- Availability of auto-restart function in case of power loss for overnight operations.

Main Technical Parameters

Ordering Information → Technical Parameters ↓	BGD 701	BGD 702	BGD 703	BGD 704	BGD 706
Max. Stirring Capacity (water)	20 L		40 L		70 L
Motor Rating Input	60 W		120 W		180 W
Motor Rating Output	50 W		100 W		160 W
Power	70 W		130 W		200 W
Timing Function	---				0 ~ 99h 59min
Speed Range (rpm)	50–2,200				50–1,100
Speed Display Accuracy	±3 rpm				±10 rpm
Display	LED	LCD	LED	LCD	LCD
Voltage/Frequency	100V ~ 240V; 50HZ/60HZ				
Max. Torque	40 N.cm		60 N.cm		300 N.cm
Max. Viscosity	10,000 mPa.s		50,000 mPa.s		100,000 mPa.s
Chuck Range Diameter	0.5 mm–10 mm				
Dimension（W×H×D）	83 mm×220 mm×186 mm				
Weight	9.3 kg		9.7 kg		11.6 kg
Packing List	① LCD or LED digital overhead stirrer head----1 pc ② Flat Base ------1 pc (Big base is optional for BGD 706) ③ Main Pole------1 pc ④ Dispersing pole with four leaf-------1 pc				



BGD 702/704/706



BGD 701/703

Air Pneumatic Mixer

These air pneumatic mixers are designed to be used in explosion-proof requirements environment, such as oil-based paints or some special solvents. They use compressed air (5kg/cm^2/70psi) as power, and can be moved anywhere to finish mixing.

- Explosion-Proof (no electric and spark)
- Motor will not be hot when the machine working
- Motor can rotate clockwise or counter-clockwise



BGD 722



BGD 723



BGD 725

Technical Parameters → Ordering Information ↓	Power	Max.Torque	Working Speed	Capacity	Structure
BGD 720 Air Pneumatic Mixer	0.1 HP	0.64 N.m	0–1100 r/min;	1–10 kg	Floor Mode
BGD 722 Air Pneumatic Mixer	0.25 HP	1.56 N.m	0–900 r/min	20–50 kg	Floor Mode
BGD 723 Air Pneumatic Mixer	0.25 HP	1.56 N.m	0–900 r/min	20–50 kg	Transportable (With bench)
BGD 725 Air Pneumatic Mixer	0.5 HP	4.8 Nm	0–720 r/min	50–200 kg	Transportable (No bench)

High-speed Dispersing Machine (HSD Machine)

What is dispersing in the coating field? It means that in the manufacturing process solid materials are made to be distributed evenly in the liquid; in the process of dispersion, pull of particulates are broken down. The round saw tooth-type dispersion tray influenced by the electromotor will be dispersing in the container to effect the solid and liquid dispersion, moisturization, depolymerization. Its work principle description is mainly as follows:

- Make the serosity annular and cause powerful vortex, so the particulates of the serosity fall to the bottom vortex bottom,
- An 2.5-5mm eldge in the dispersion tray is formed a flow area in which the particulates are impacted intensely.
- Two beam currents outside the area are formed to make the serosiy fully circulated and turned over.
- What is below the dispersion tray is a current flow, serosity with different speed disperses mutually to effect the function of dispersion

Biuged offer many different High-speed dispersing machines,they are applicable to the stir, dissolution and dispersion of coating, paint, ink, dyestuff, cosmetic goods, foodstuff, resin, adhesive, latex, medicine, petroleum, whose speed can be adjust at will.

Features:

- With squirrel-cage motor of frequency controland use frequency converter to adjust working speed

◆ Direct digits display axis revolution through display screen of frequency converter installed on the machine.

◆ No carbon brush, no produce any flame when working.

◆ Lower noise, bigger torque and wider adjustable speed.

◆ Main parts are all made up of stainless steel, with perfect corrosion resistance.

◆ Power Supply: 220V 50HZ

◆ BGD 740/1 & BGD 740/2 have lifting lever marked with scale, which are convenient to adjust the distance of dispersing blade to container bottom.


BGD 740/1


BGD 740/2


BGD 740/3


BGD 742/2


(The holder is optional)


BGD 740/5

Ordering Information	Motor Power	Speed (r/min)	Max Torque	Lift Distance	Lift System	Come with dispersing blades size（mm）	Overall Size，mm W×D×H（Low～Top）
BGD 740/1	550W	0–7,500	1.91N.m	240 mm	Manual	35, 50, 60 & 80	475×430×560～800
BGD 740/2	750W	0–6,000	2.87N.m	245 mm	Manual	35, 50, 60 & 80	475×430×560～800
BGD 740/3	1,100W	0–6,000	3.82N.m	320 mm	Electric	60&80	675×570×1180
BGD 740/4	1,500W	0–5,000	5.73N.m	320 mm	Electric	80&100	675×570×1180
BGD 740/5	2,200W	0–4,000	7.64N.m	520 mm	Electric	100&120	700×720×1300～1470
BGD 741/1	550W	0–7,500	1.91N.m	300 mm	Electric	35, 50, 60 & 80	530×430×850～880
BGD 741/2	750W	0–6,000	2.87N.m	300 mm	Electric	35, 50, 60 & 80	530×430×850～880
BGD 742/2 (Explosion–proof)	750W	0–3,000	2.87N.m	300 mm	Manual	35, 50, 60 & 80	530×560×965～980
BGD 742/5 (Explosion–proof)	2,200W	0–3,000	7.64N.m	520 mm	Manual	100&120	640×680×1430～1500

The explosion-proof high-speed disperser produced by Biuged is designed to meet the highest explosion-proof standards. Its motor is equipped with a Siemens Beide explosion-proof motor (with explosion-proof certification and CCC certification), rated at IIB T4 Gb. Additionally, the explosion-proof control box features the following characteristics:

◆ Large-size design to meet the heat dissipation requirements of the frequency converter, equipped with an air circuit breaker.

◆ Explosion-proof construction with a rating of IIB T6 Gb, suitable for Zone 1 applications (unlike common products rated only for Zone 2 with Gc classification).

◆ The box is made of high-quality thickened carbon steel plate, with a thickness that fully complies with explosion-proof verification requirements and can undergo explosion resistance testing.

◆ Equipped with a motor speed adjustment knob, eliminating the need for remote or button operation, ensuring user-friendly control.

（See page 126 for different size dispersing blades, dispersing containers and other accessories ）

Multifunction High Speed Dispersing Machine

B745 Multifunction High Speed Dispersing Machine is developed newly after collecting many customers suggestions, and also got many patents. Compared with traditional products, it adds many practical functions and let laboratory dispersing work become more scientific, high efficiency and easy.

Main Features:

◆ New brushless DC motor: Has wider adjustable working speed, ultra-low noise when working（avoid electromagnetic noise from tradition AC motor）.Moreover, DC motor has a feedback system to working speeding and can monitor speed more precisely.

◆ Touch screen design: Setting working parameters become more simple and easy. All state parameters are shown directly and clearly, easy to operate.

◆ Show directly linear velocity of current dispersing blade, save time to calculate linear velocity by dispersing blade size and working speed for operator.

◆ New auto location clamping device for container: Rotate locking handle to fasten container at the central position automatically, safe, simple and convenient.

◆ High quality one body mixer shaft: Made up of high quality 304SS, anti-corrosion and easy to clean.

◆ Monitor sample temperature: With infrared temperature probe, can real-time monitor dispersed sample without touch-ing sample. Operator also can set a certain temperature by touch screen for preventing sample changing because of over heat generating from milling.

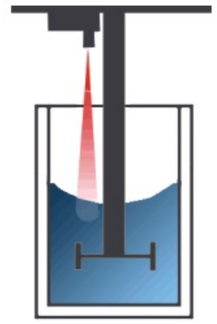
◆ Timing device for dispersing: Operator can set dispersing time, the machine would be stopped automatically when arrive this time

◆ Can choose arc bottom container with double-layer and sand-mill blades for bead mill.

Main Technical Parameters：
★ Motor Power：1000W（Brushless DC motor）
★ Adjustable working speed：200～6,000r/min
★ Lift distance：260mm
★ Overall Dimension：500mm×455mm×965mm（From low to top）
★ Net Weight：40 kg
★ Come with dispersing blades：Φ50mm and Φ80mm, one each.
★ **Ordering Information:**
BGD 745–––Multifunction High Speed Dispersing Machin
（See page126 for different size dispersing blades dispersing containers and other accessories ）



Operation Menu


Measure Sample Temperature with infrare



Super High Speed Dispersing Machine

BGD 746 Super High Speed Dispersing Machine integrates super high-speed dispersion, stirring and automatic control of lift distance. It can meet the application requirements of customers for super high-speed dispersion and homogeneous emulsification, with the excellent dispersion and emulsification effects, as well as high dispersing efficiency. In addition, this machine is operated by a large-size touch screen, which is powerful, convenient and practical.

Features

- Super high-speed motor: The max. speed can reach 20,000 r/min. Bigger torque, lower noise and lower power consumption
- The max. lift distance can reach 300mm. Servo system for locating can precisely feedback the height information in real time.
- Dispersing blade can be set to stay at the required height, which is suited to different sizes of dispersing containers or different material levels. At the same time, the use safety can be improved.
- In the whole dispersing process, dispersing blade can circularly lifted up and down at the same time: lift distance and speed can also be set. Greatly improve the dispersion efficiency.
- With the 7-inch touch screen, the tip speed, torque ratio and the height of dispersing blade can be displayed in real time.
- Test parameters can be set, such as speed, run time, diameter, height, etc.
- Suitable for containers with the capacity of 0.5L-5L, and can meet more different test requirements.

Main Technical Parameters：
★ Rated Power of Motor: 1.5kW
★ Rated Motor Torque: 1.6 N.m
★ Adjustable Working Speed: 100rpm ~ 20,000rpm
★ Lift Speed: 0 ~ 30mm/s
★ Max. Lift Distance: 300mm
★ Length of Stirring Rod: 220mm
★ Dimension (W × D × H): 470mm × 470mm × 920 ~ 940mm (From low to top)
★ Gross Weight: 84 kg
★ Power Supply: 220V, 50/60Hz
★ Max. Power of whole machine: 2kW
★ Come with two dispersing blades: Φ50mm and Φ60mm
★ **Ordering Information**: BGD 746---Super High Speed Dispersing Machine （See page 126 for different size dispersing blades，dispersing containers and other accessories ）



Operation Menu



Versatile Sand-Milling Dispersing-agitator

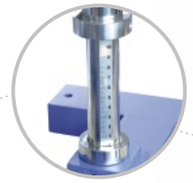
BGD 750 series Versatile Sand-Milling dispersing-agitator is a new product designed by our company. It is equipped with two sand-milling discs, two dispersing blades and a double-layer stainless steel container. With only one machine, operator can finish such as sand-milling, high speed dispersing and mixing. Furthermore, electric lift design is very convenient for female operator.

Features:

- With squirrel-cage motor of frequency control and use frequency converter to adjust working speed
- Direct digits display axis revolution through display screen of frequency converter installed on the machine.
- No carbon brush, no produce any flame when working
- Lower noise, bigger torque and wider adjustable speed
- Main parts are all made up of stainless steel, with perfect corrosion resistance
- Inlet and outlet of cooling water are equipped with fast joints, convenient for operator to install or remove quickly.
- Container is produced by a whole special mould, no welding line and bottom is arc structure, can be cleaned completely. Very convenient for operatore to do the different color sample.
- Standard confirguration: Two or four (only for 550W&750W) different dispersing blades, two different size sand-milling blades, a stainless steel double jacket container.
- Power Supply: 220V 50Hz
- BGD 750/1 & BGD 750/2 have lifting lever marked with scale, which are convenient to adjust the distance of dispersing blade to container bottom.



BGD 750/1



The lifting lever marked with scale, which are convenient to adjust the distance of dispersing blade to container bottom.



BGD 750/2



BGD 751/2



BGD 752/2

(The holder is optional.)



BGD 750/3



BGD 750/5

Ordering Information	Motor Power	Speed (r/min)	Container Capacity	Lift Distance	Lift System	Dispersing blades（mm）	Sand-Mill blades（mm）	Overall Size，mm W×D×H（Low～Top）
BGD 750/1	550W	0–7,500	1.25 L	240 mm	Spring lift by hand	35, 50, 60 & 80	50&60	475×430×560～800
BGD 750/2	750W	0–6,000	1.25 L	245 mm	Spring lift by hand	35, 50, 60 & 80	50&60	475×430×560～800
BGD 750/3	1,100W	0–6,000	3 L	320 mm	Electric	60&80	90&100	675×570×1180
BGD 750/4	1,500W	0–5,000	3 L	320 mm	Electric	80&100	90&100	675×570×1180
BGD 750/5	2,200W	0–4,000	5 L	520 mm	Electric	100&120	100&130	700×720×1300～1470
BGD 751/1	550W	0–7,500	1.25 L	300 mm	Electric	35, 50, 60 & 80	50&60	610×430×850～880
BGD 751/2	750W	0–6,000	1.25 L	300 mm	Electric	35, 50, 60 & 80	50&60	610×430×850～880
BGD 752/2（Explosion–proof）	750W	0–3,000	1.25 L	300 mm	Spring lift by hand	35, 50, 60 & 80	50&60	530×560×965～980
BGD 752/5（Explosion–proof）	2,200W	0–3,000	5 L	520 mm	Spring lift by hand	100&120	100&130	640×680×1430～1500

See below for different size dispersing blades, sand-milling blades, dispersing containers and other accessories

Accessories for Dispersing or Milling

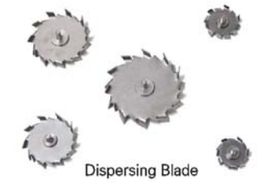
When the sample is dispersed or milled, in order to achieve the best working efficiency, operator should choose suitable size dispersing blades， milling blades or containers according to the sample viscosity, quantities or other physical features.

Biuged has rich experience for designing and producing these dispersing blades, milling blades and containers.

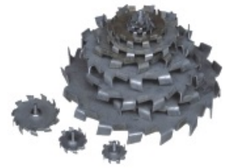
All dispersing blades are made of special abrasion resistance stainless steel, and produced by precise mould. The number of dispersing teeth and the angle of inclination are designed as European products, which can make the sample occur turbulent flow easily and increase dispersing efficiency. Furthermore, Biuged also designs efficient dispersing blades which are used for low viscosity sample, threr are four arc holes in its surface, which can disperse sample smaller and uniform.

For milling blades, all materials are special grade super abrasion resistance PTEE, which can lengthen service life to 2-3 times compared to similar goods on the market, furthermore, these blades have a high concentricity, so the working noise is low.

Biuged also offers different volume dispersing containers, they are all made of good quality thicken stainless steel both inner wall and outer wall are more than 5mm. Except 0.3L, other contains are designed with double-wall which can add cooling water. Furthermore, the inlet and outlet are designed with quick couplings which are very convenient for operator to insert or remove cooling pipes.



Dispersing Blade





Sand–milling Blade





Dispersing Container

Biuged Containers Size

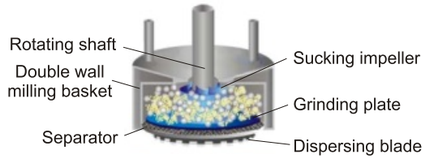
Ordering Information	BGD 750/Z-018	BGD 750/Z-019	BGD 750/Z-020	BGD 750/Z-021	BGD 750/Z-022	BGD 750/Z-023	BGD 750/Z-024
Volume	0.3 L（Single–wall）	0.5 L	1.25 L	3 L	5 L	10 L	20 L
Inner Diameter	73 mm	85 mm	103 mm	129 mm	164 mm	214 mm	268 mm
Inner Depth	71 mm	95 mm	165 mm	236 mm	253 mm	282 mm	355 mm
Welded Bottom	√	√	×	√	√	√	√
Arc Bottom	×	×	√	×	×	×	×
Handle	×	×	×	√	√	√	√

◆ Ordering Information for Accessories

BGD 750/1–J–019–––Extend Shaft for Dispersing Blade（25mm length, For BGD 741）
BGD 750/1–J–020–––Extend Shaft for Dispersing Blade（40mm length, For BGD 741）
BGD 750/Z–001–––35 mm Dispersing Blade
BGD 750/Z–002–––50 mm Dispersing Blade
BGD 750/Z–005–––60 mm Dispersing Blade
BGD 750/Z–008–––80 mm Dispersing Blade
BGD 750/Z–009–––100 mm Dispersing Blade
BGD 750/Z–010–––120 mm Dispersing Blade
BGD 750/Z–011–––150 mm Dispersing Blade
BGD 750/Z–012–––200 mm Dispersing Blade
BGD 750/Z–013–––50mm Super Wear–Resistant Sand–milling Blade
BGD 750/Z–014–––60mm Super Wear–Resistant Sand–milling Blade
BGD 750/Z–015–––90mm Super Wear–Resistant Sand–milling Blade
BGD 750/Z–016–––100mm Super Wear–Resistant Sand–milling Blade
BGD 750/Z–017–––130mm Super Wear–Resistant Sand–milling Blade
BGD 750/Z–018–––0.3 L Dispersing Container
BGD 750/Z–019–––0.5 L Dispersing Container
BGD 750/Z–020–––1.25L Dispersing Container
BGD 750/Z–021–––3L Dispersing Container
BGD 750/Z–022–––5L Dispersing Container
BGD 750/Z–023–––10L Dispersing Container
BGD 750/Z–024–––20L Dispersing Container
BGD 752/2–J–011–––Stand for Explosion–proof box

Lab Basket Mill

BGD 755 series Lab Basket Mill is an integrated equipment, which combines milling and dispersing to reduce particle size for paint, coatings, inks and pigment dispersions applications. The basket mill integrates high speed dissolving and pump wheels, a very narrow particle size distribution can be achieved in this machine.





In the figure:

- Yellow balls represent the material being ground
- White balls represent the high-speed movement of zirconia beads inside the grinding basket
- Blue part represents Zirconia grinding plate and basket significantly improve resistance and avoid metal contamination

Features

- Replaceable basket structure, easy to clean
- Easy to maintain and move from one batch to another different product production
- Little grinding media required
- Double wall milling basket and double wall container for cooling an heating is optional
- Excellent mill results

Main Technical Parameters：
★ Parameter of motor：1,100W/1,500W/2,200W；220V 50Hz
★ Rotation speed：900r.p.m–2,800r.p.m
★ Processing Capacity：5L–20L
★ Control Method：Stepless speed control, with digital speed display
★ Suitable Grinding Medium：95% Zirconia beads, 1.6mm–1.8mm
★ Material：The part contacting with material is SS304
★ Lifting System：Electric Lift automatically
★ **Ordering Information:**
BGD 755/3–––1100W Basket Mill (5L)
BGD 755/4–––1500W Basket Mill (10L)
BGD 755/5–––2200W Basket Mill (20L)



BGD 755/3



BGD 755/4



BGD 755/5

Lab Scale Basket Mill (New)

For paint, ink laboratory special requirements, Biuged develops a newest high quality Lab Basket Mill. Compared with the traditional products, main parts of milling basket, such as basket wall, milling blades and pump impeller, are made of strong abrasion resistance material---zirconia (Other suppliers use stainless steel), extend greatly the service time of mill and also reduce influence to color of sample milled in basket.

Moreover, in order to offer a convenience for customers to replace sample rapidly and clear the basket completely, we design the basket as easy to dismantle structure. Customers can inspect the grinding medium（beads）usage and replace it at any time.

Features

- With 750W squirrel-cage motor of frequency control and use frequency converter to adjust working speed
- Direct digits display axis revolution through display screen of frequency converter installed on the machine.
- No carbon brush, no produce any flame when working
- Lower noise, bigger torque and wider adjustable speed
- Another dispersing blade is installed under the basket, disperse and mill the sample at the same time.
- Electric lift（For BGD 756/1&BGD 756/2）, easy and convenient to operate
- Double wall milling basket and double wall container for cooling rapidly（For BGD 756/2）
- Excellent mill results, can mill sample size to below 10μm shortly.

Main Technical Parameters：
★ Motor Power：750W
★ Working Speed：0–3,000 r.p.m（Adjustable）
★ Lift Distance：300mm
★ Container Capacity：1.25L / 3L
★ Milling Basket Capacity：160ml/260ml
★ Suitable Added Amount for Mill Medium：340g/400g
★ Suitable Mill Medium Size（mm）：1.8mm–2.0 mm
★ Milling Blades Size：Φ52mm/60mm
★ Dispersing Blades Size：Φ60mm/80mm
★ Overall Size：480mm×430mm×970mm
★ Net Weight：50 kg
★ Power Supply：220V 50Hz/60Hz
★ **Ordering Information:**
BGD 756/1–––Lab Scale Basket Mill (1.25L)
BGD 756/2–––Lab Scale Basket Mill (3L)
BGD 756/1EX–––Lab Scale Explosion–proof Basekt Mill (1.25L)
BGD 756/2EX–––Lab Scale Explosion–proof Basekt Mill (3L)
BGD 756/Z–001–––Milling Basket (160ml)
BGD 756/Z–002–––Milling Basket (260ml)
BGD 756/Z–003–––Milling Blade (For BGD 756/1)
BGD 756/Z–004–––Milling Blade (For BGD 756/2)





The grinding basket is easy to detach and clean

Lab Horizontal Sand Mill

BGD 757 Lab Horizontal Sand Mill is a small and efficient machine for grinding nano materials. It adopts a fully closed structure and a dynamic separation system, its grinding disc is the structure of ceramic disc type and can use grinding media in the range of 0.8mm to 1.6mm. This machine is used for wet ultra-fine grinding of solid particulate materials dispersed in liquid, and is suitable for multiple grinding or cyclic grinding and dispersing operations. This machine can make the materials achieve the effects of ultra-fine grinding and dispersion in a very short time (the fineness can reach 2 μm -15 μm).

This machine is very suitable for high speed grinding of small batch water-based samples (0.5 kg ~ 1 kg) in laboratory. The machine can grind products of similar size and evenly distributed. It is characterized by simple operation and easy maintenance, convenient cleaning and low energy consumption.

Feature

- All materials of machine in contact with materials adopt advanced wear-resistant materials (zirconia, silicon carbide, special wear-resistant steel), with long service life and no discoloration phenomenon.
- Simple appearance, modular design, compact structure and convenient operation
- The separation method adopts dynamic separation of dynamic sheets and static sheets, which can offer self-cleaning function and no blockage phenomenon.
- Feed in self-circulation mode and discharge in self-suction mode without pump.
- The machine front install discharge valve which can reduce residuum and clean easily.
- Flexible working mode, less waste of materials, convenient disassembly and assembly, fast conversion of experimental formula.

Main Technical Parameters:
★ Grinding Chamber Volume: 0.35 L
★ Capacity: 0.5L ~ 0.8L
★ Working Speed: 0 rpm ~ 1425 rpm
★ Recommended Grinding Medium Diameter: ⩾1.4mm
★ Grinding Medium Weight: 0.8kg ~ 0.9kg
★ Main Part Material: The material of internal grinding chamber are wear–resisting alloy steel and carborundum, the material of grinding disk is advanced wear–resisting ceramic zirconia.
★ Motor Power: 0.75 kW
★ Consumption of Circulating Cooling Water: (0.4 ~ 0.6) m^3/h
★ Overall Size: 650mm × 400mm × 500mm (L × W × H) /65kg
★ Power Supply: 220V 50Hz
★ **Ordering Information:** BGD 757––Lab Horizontal Sand Mill



Ceramic Sand Mill Blade with Disk Structure



Coating Fast Mixer

Having a high efficiency mixer for the dispersing job becomes more necessary. That is why we designed our coating fast mixer. BGD 760 mixers are a great mixing solution that are capable of handling an extremely broad range of materials for countless applications including automotive, chemical, wood finishes, marine, R&D, and various lab settings.

- Suitable for a wide range of mixing applications
- With two types for option:

Carrying Can--- Shakes a variety of containers of all sizes and shapes（User should prepare container by himself. The max. diameter of container is 180mm, the container height range is from 65mm to 180mm）

Carrying Bottle---Shakes eight glass bottles whose capacity is 200ml （Each arm has four bottles, and every bottle can finish dispersing of 150ml sample）

- Two different structures: Column type and Floor type, are suitable different applications
- With timer can automatically stop mixing cycle

Main Technical Parameters:
★ Motor：550W 220V 50Hz
★ Crankshaft Revolution：660r/min
★ Main Shaft Reciprocating Stroke：16mm
★ Upper and lower maximum Amplitude：8mm
★ Head Arm Swinging Angle：30°
★ Overall Dimension：790mm × 520mm × 1090mm （L × W × H）
★ Weight：80 kg



Floor Type



Column Type

★ **Ordering Information:**

BGD 760/1–––Coating Fast Mixer （Column type with carrying can）
BGD 760/2–––Coating Fast Mixer （Column type with carrying bottle）
BGD 760/3–––Coating Fast Mixer （Floor type with carrying can）
BGD 760/4–––Coating Fast Mixer （Floor type with carrying bottle）

Closed Paint Mixer/Shaker

BGD 763 & BGD 764 Closed Paint Mixers/Shakers can offer perfect solutions for mixing of paint and similar materials quickly. Operators only need to put the container with materials which need to be dispersed into the machine, clamp it with a special clamping device, set dispersion time, materials will be quickly and effectively dispersed through high-speed rotating and shaking. It's easy and convenient to operate with good dispersion result, without leakage of VOC or pollution, effectively improve environment of workshops or laboratories.

According to working principle, these closed paint mixers and shakers are divided into two types: shaking type and rotating type. The container of shaking type is shaken up and down, back and forth repeatedly at high speed; while the container of rotating type revolves and rotates in all directions at the same time.

Features:

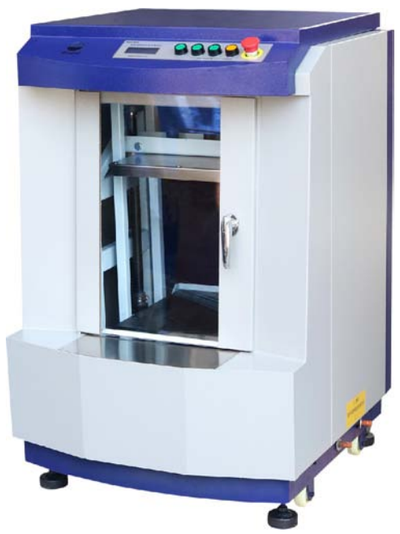
Automatic Shaking Type Mixer:

- Independently developed and customized chip control technology, intelligent, visual and user friendly

- Automatically run self-checking program before operation.
- Preset mixing time, LCD displays entire working status.
- Automatically detect container size and adjust platen height.
- Automatically tighten or loosen container, automatically adjust clamping force according to container's size.
- Adjust or set working parameters (such as language, clamping force, etc.) through control panel.
- Recognize fault through error code which display on LCD screen.
- Stop working or increase working time through buttons on panel.
- Trapezoid structure + separation of machine and shell, stable vibration and low noise.
- Emergency stop switch and double door lock structure ensure safety.
- Drum design, easy to load or unload container.

Automatic Rotating Type Mixer:

- Independently developed and customized chip control technology, intelligent, visual and user-friendly.
- Automatic initialization when power on.
- After starting up or pressing emergency stop button, enter into working status without initialization if the clamping device is in a vertical position.
- Preset mixing time, LCD displays entire working status.
- Automatically detect container size and adjust platen height.
- Automatically tighten or loosen the container, and automatically adjust clamping force according to container's size.
- Adjust or set working parameters (such as rotation direction, rotation speed, language, clamping force, etc.) Through control panel.
- Multi-stage frequency conversion speed regulation technology, automatically adjust rotation speed, pressure, etc.
- 720 degree forward and reverse rotation technology various rotation modes are available.
- Emergency stop switch and double door lock structure ensure safety.
- Motor brake positioning replaces the old electromagnet technology, more efficient and reliable.
- Recognize fault through error code displayed on LCD screen .
- Stop working or increase working time through buttons on panel.
- The lower clamping plate can be moved forward to easily load or unload container.



BGD 763/3



BGD 764/3

Ordering Information → Parameters ↓	BGD 763/3	BGD 764/3
Working Method	Shaking	Rotating
Clamping Container Method	Automatic	Automatic
Suitable Container Capacity	0.5L～20L（1kg～35 kg）	
Suitable Container Height	50mm–410mm	
Shaking Frequency	700 times/min	----
Rotating Speed (times/min)	----	Low speed: 100（big container） High speed: 150（small container）
Working Time	15–30–45–60 min.	1–2–3–4–5–6–7–8–9–10 min.
Working Noise	<70 dB	
Motor Power	0.75 kW	
Power Supply	220V/50Hz（110V/60Hz need to be custom）	
Net Weight/Gross Weight	200 kg/240 kg	178 kg/235 kg
Overall Size (H×W×D,mm)	1050×720×750	1040×800×770
Optional Accessories	BGD 1900---Special Wood Clamp（Sadokus） For shaking several different samples simultaneously（each volume≤1L）, need to be custom according to customer's container size. * Power supply and special cover color can be customized	

Muller Laboratory Grinder

BGD 650 Muller Laboratory Grinder is a sturdy machine, enabling optimal and perfectly reproducible grinding and dispersion to be obtained in the laboratory. It has been designed to grind and discharge small amounts of raw materials for paint and varnish.

This unit consists of a steel frame holding two ground-glass plates, the lower of which is motor driven. A LCD screen can help operator set the total number of revolutions and automatically stops the motor once the user's defined number of revolutions has been met.Furthermore, it also can show the total after each test cycle.

An amount of raw material is spread over a limited area of the lower glass plate. The mixture is ground in successive stages, for example 50 revolutions each, at a pressure, of 445N. Between each stage, the mixture should be redistributed within the limited area.

BGD 650 Muller Laboratory Grinder is suitable for preparing dispersions for testing mass color and tinting strength and preparing small samples for use in the quality control of pigments.

It can be used in accordance with ASTM D387, ASTM D332-B, ISO 8780-5, ISO 787-16.

Features:

- Controlled intelligently by microcomputer, counting accurately, reliable working status
- Touch screen and user-friendly operation interface allow operator easily to set test parameters
- Use coupling with flexible connection method to connect reducer with motor, has big torque, no step to lose and self-protection.
- Grinding glass are made of heat-resisting, pressure-resisting and colorless sight glass after precise grind, with high flatness, strong and durable and no any influence to light colored sample.

Main Technical Parameters:
★ Motor Power: 0.75kW
★ Power Voltage: 380V 50Hz（220V can be Customized）
★ Working Speed: 75±5r/min
★ Load: 43KG; 64KG; 100KG
★ Weights: 1.75KG; 3.5KG; 6.4KG
★ Grind Plate Diameter: 240mm
★ Digital Displaying Range: 0～9,999
★ Overall dimension（L×W×H,mm）: 530×360×480 Weight: 80KG
★ **Ordering Information:** BGD 650---Muller Laboratory Grinder
BGD 1470--- Special Glasses for Muller (1pair/2pcs)



Ceramic Three-Roll Mill

The BGD 775 series Ceramic Three-Roll Mill features rollers made of zirconia or high-purity alumina ceramic. Compared with conventional mills fitted with chilled cast iron or alloy steel rollers, it boasts the following outstanding advantages:

◆ **Zero metallic contamination for guaranteed material purity (Core Advantage)**

Conventional steel rollers suffer slight wear during long-term grinding, releasing iron, chromium and nickel ions. When processing silver paste, lithium battery slurry, white transparent colorants and pharmaceutical ointments, such metal contamination leads to blackening, yellow discoloration, reduced electrical conductivity and finished product rejection.

Ceramic rollers feature superior chemical inertness and do not react with acids, alkalis, solvents or metal powders, introducing zero metallic impurities throughout processing. They are ideal for conductive silver paste, lithium battery electrode materials, transparent UV inks, lipsticks/ointments and high-purity ceramic slurries. When grinding light-colored, white or transparent materials, no grey-black impurities abraded from rollers will contaminate the batch, resulting in minimal color deviation between batches.

◆ **Exceptional corrosion resistance compatible with strong acid, alkali and solvent systems**

Steel rollers cannot withstand strong acids, strong alkalis, fluorine-containing additives and highly corrosive organic solvents. Prolonged use causes rust and pitting on roller surfaces, rapidly deteriorating gap precision.

Ceramic rollers resist erosion from ketones, esters, alcohol ethers, weak acids, weak alkalis and fluorinated corrosive media. They support long-term grinding of anti-corrosion coatings, etching inks and acidic additive systems, greatly expanding the range of processable materials.

◆ **Ultra-high hardness and wear resistance for long-term stable roller gaps and extended service life**

Alloy steel rollers generally have a hardness of HRC 58-62, while zirconia ceramic rollers reach HRC 90+, delivering a service life 3 to 6 times longer than steel counterparts.

When grinding high-hardness fillers (alumina, titanium dioxide, silicon carbide, metal powders), steel rollers wear and deform rapidly, whereas ceramic rollers experience minimal abrasion and maintain micron-level gap precision over long production runs. Stable gap consistency ensures uniform fineness across batches, eliminating the issue of fine initial grinding followed by coarser output and reducing rework rates.

In addition, ceramic materials possess a higher elastic modulus, preventing roller bending and deformation under high-pressure extrusion of high-viscosity materials. Uniform grinding across the entire roller surface avoids uneven fineness (coarser at both ends and finer in the middle).

◆ **Dense non-absorbent surface for easy cleaning and fast color switching**

Sintered ceramic rollers are pore-free with mirror-polished surfaces, exhibiting low slurry adhesion, resistance to pigment penetration and no residual dead zones. Traditional cast iron rollers contain micro-pores that absorb pigments, requiring large volumes of solvent for color change cleaning.

Ceramic rollers cut solvent consumption for cleaning by over 30% and drastically improve color-switching efficiency, offering distinct benefits for production lines with frequent shifts between multiple colorants and formulas.

This ceramic three-roll mill complies with GMP cleanliness standards for pharmaceutical and food industries; it can be cleaned with water, wiped with alcohol and disinfected at high temperatures with zero risk of cross-contamination between materials.



BGD 775/1 Three Roller Mill



Operating Principle

◆ **Superior grinding and dispersion performance for enhanced gloss and finer particle size**

Smooth, uniform ceramic rollers deliver evenly distributed shear force to fully break up pigment and powder agglomerates, producing a narrower particle size distribution. Under identical processing parameters, materials ground by ceramic rollers achieve finer fineness, resulting in higher film gloss and stronger tinting strength after coating formation.

For high-viscosity, high-solid-content slurries such as conductive adhesives, lithium battery pastes and UV inks, greater extrusion pressure can be applied, enabling higher dispersion efficiency than standard steel roller models.

◆ **Low-temperature grinding capability to prevent deterioration of heat-sensitive materials**

Ceramic conducts heat evenly. When equipped with an independent temperature control module, roller surfaces maintain uniform temperature without localized hotspots. In contrast, steel rollers generate concentrated heat via localized friction, triggering yellowing and gelation of resins, heat-sensitive pigments and photosensitive UV materials.

Furthermore, the ceramic three-roll mill supports continuous long-hour production, stabilizing the performance of heat-sensitive materials without degradation during processing.

Technical Features

- Single-handle roller gap adjustment and stepless speed regulation; the HMI intelligently captures roller gap values and operating speeds
- Imported nano-grade ceramic rollers with multiple material options available
- Fast and convenient gap calibration without dismounting the equipment housing
- Precision specifications of ceramic rollers: concentricity <2 μm, straightness <2 μm, surface flatness <0.3 μm



BGD 775S/1
Intelligent Ceramic Three-roll Mill



BGD 775S/2
Intelligent Ceramic Three-roll Mill

Ordering Information → Parameters ↓	BGD 775/1 Ceramic Three-roll Mill	BGD 775S/1 Intelligent Ceramic Three-roll Mill	BGD 775S/2 Intelligent Ceramic Three-roll Mill
Roll Material	Al_2O_3 or ZrO_2 (Two options available; stainless steel is also optional)		
Blade material	Polyester or stainless steel (ZrO_2 is also optional)		
Roller length	150mm		
Roller diameter	50mm		65mm
Production Capacity	0.02–5L/h		0.02–14L/h
Speed ratio	1 : 2 : 4		
Adjustable Speed Speed	0~500rpm (Stepless Speed Control)		
Adjustable Gap Range	1–140 μm (HMI Display)		1–150 μm (HMI Display)
Moter Power	400W		800W
Overall Size (L×W×H)	385mm×263mm×276mm	505mm×291mm×349mm	620mm×380mm×470mm
Net Weight	19 kg	20 kg	50 kg
Fingerprint Recognition Function	×	√	×
Curve Display Function	×	√	√
Optional Temperature Control Module	×	×	√ (20℃~50℃)

Three Rollers Grinder

BGD 770 series Three Rollers Grinder is widely used in paste materials including inks, Paint, Pigment, Soap, Artificial leather, Plastics, Lubricant grease, Chocolate and so on. Especially for high viscosity and fineness material .The mill roller is made of high hardness alloy and anti abrade, also equipped with cooling device for continuous operation.



BGD 770/1

Ordering Information		BGD 770/1	BGD 770/2	BGD 770/3	BGD 770/4	BGD 770/5
Roller diamter(mm)		65	100	150	200	260
Working length(mm)		125	250	300	500	675
Speed (R.p.m)	Slow	26	28	34	19	23
	Middle	70	66	78	55	64
	Fast	145	152	181	155	183
Motor Power (kw)		0.55	1.5	2.2	4.0	7.5
Capacity (L)		5	30	60	100	150
Overall size (mm)		410x400x450	680x600x700	830x830x930	1180x1120x980	1680x1320x1150
Weight (kg)		80	300	500	800	2100

Note: we also offer three Rollers Grinders whose whole body are stainless steel

BGD 771 series Improved Three Rollers Grinder use good quality material as drive section, its transmission gear adopts oil-immersed way and the operative handweel is transmitted by gear, with abrasion resistance, low voice, easy to repair etc. advantages. Moreover, Using gear adjust the roller and roller (but BGD 770, use spring to adjust) and make adjust become more easy. And the coppery baffle is designed as butterefly model, the operator can clean the coppery knife easily. Particularly it is suitable for ginding the products with high dispersive viscosity and size.

Ordering Information		BGD 771/1	BGD 771/2	BGD 771/3
Roller diamter(mm)		150	260	305
Working length(mm)		300	675	760
Speed (R.p.m)	Slow	34	23	15.8
	Middle	78	64	47.4
	Fast	181	183	142
Motor Power (kw)		2.2	7.5	11
Overall size (mm)		920×880×1150	1690×1330×1300	1655×1490×1400
Weight (kg)		500	2000	3800



Electrical Balance

Biuged offers a range of laboratory scales for accurate measurements during the development of a coating. The Biuged range of balances provides the user with a choice of standard, analytical or precision balance, with or without enclosed cabinet.

Features

- Calibration function
- Whole range of gross to net conversion
- Unit conversion（g,CT,OZ,1b）
- Power: AC 220V±10% 50HZ±1HZ DC 9V
- Higher resolution
- LED indicator
- With RS-232 interface.

Ordering Information	Max Load Capacity	Resolution	The size of the weighing platform	Hurricane globe
HZY–A 220	220g	0.001g	Φ80mm	√
HZT–A 200	200g	0.01g	Φ125mm	----
HZT–A 500	500g	0.01g	Φ125mm	----
HZT–A 1000	1000g	0.01g	Φ125mm	----
HZT–A 2000	2000g	0.01g	Φ125mm	----
HZT–B 2000	2000g	0.1g	155×175mm	----
HZT–B 3000	3000g	0.1g	155×175mm	----
HZT–B 5000	5000g	0.1g	155×175mm	----
HZT–B 6000	6000g	0.1g	155×175mm	----



HZT



HZY

Balance





- Techology for ceramic capacitor
- Overload impact（50X）protection
- Response quickly, short stabilization time
- Aluminum shell from die casting, sturdy and durable
- RS 232 duplex channel Units conversion（g, CT, Oz）
- Multiple anti–vibration design let it can work under more complicate environment

Ordering Information → Technical Item ↓	BL-120	BL-200	BL-410	BL-500	BL-1200	BL-2000	BL-4100	BL-5000
Capacity（g）	120	200	410	500	1200	2000	4100	5000
Readability（g）	0.001				0.01			
Repeatability（g）	±0.001				±0.01			
Linearity（g）	±0.002				±0.02			
Keyboard	Six key				Six key			
Pan Size	ϕ122mm				ϕ158mm			
Wind Shield	Standard				----			
Security Lock Kit	Option				Option			
Size（L×W×H）	279mm×178mm×290mm				279mm×178mm×78mm			
Interface	Bidirectional RS–232,（standard on all models）							
Display	0.57 " LED（all models）							
Power	7.2VDC（115VAC,60HZ adaptor provided）							

Precise Analytical Balance (External Calibration)

- High-resolution TFT making high-contrast display of text and graphics available
- High anti-shock capability
- Weighing speed, display mode/auto zero tracking adjustable
- Full range auto tare, temperature compensation
- Automatically error diagnose, overload protection and alarm function
- Automatic wind-shield door improves weighing efficiency
- Multiple weighing units (g / oz / ct / kg / lb)
- Standard RS-232 interface enables connections with a PC or printer

Ordering Information → Technical Item ↓	FA1104	FA1604	FA2104
Weighing Capacity （g）	110	160	210
Readability （mg）	0.1	0.1	0.1
Repeatability （≤mg）	±0.1	±0.1	±0.1
Linearity （≤mg）	±0.2	±0.2	±0.2
Pan Size （mm）	ϕ90	ϕ90	ϕ90



Precise Analytical Balance (Internal Calibration)

- High-resolution TFT making high-contrast display of text and graphics available
- High anti-shock capability
- Weighing speed, display mode/auto zero tracking adjustable
- Full range auto tare, temperature compensation
- Automatically error diagnose, overload protection and alarm function
- Automatic wind-shield door improves weighing efficiency
- Multiple weighing units (g / oz / ct / kg / lb)
- Standard RS-232 interface enables connections with a PC or printer

Ordering Information → Technical Item ↓	FB124	FB224	FB323	FB423
Weighing Capacity （g）	120	220	320	420
Readability （mg）	0.1	0.1	1	1
Repeatability （≤mg）	±0.1	±0.1	±1	±1
Linearity （≤mg）	±0.2	±0.2	±2	±2
Pan Size （mm）	ϕ90	ϕ90	ϕ90	ϕ90



Special Balance for Paint

These special balances are designed for paint, ink and other chemical fields. They have large LCD display and RS 232 output interface, and whole balance are metal construction, more durable. They can be calibrated automatically by external weights, have overload protection and check weight alarm function（the user can according to your requirements to set the upper and lower limit of the weight. And also have four weighing units（G, Ct, Oz, Dwt）and three test modes: counter, percent and weighing.



ES–K Series



ES–P Series

Technical Item → Ordering Information ↓	Capacity	Readability	Pan Size	Features
ES-P5K	5 KG	0.1g	Φ240mm	◆ Paint mixing especially suitable for bad environment conditions. ◆ Adjusting counting factor and calculation function ◆ Independent display, stainless steel stand bar of display, Angle, height and direction can be adjusted by three– dimensional ◆ The mix–painting of D&T fit to use by fast and accurate mixing paint at anywhere
ES-P8K	8 KG	0.1g		
ES-P10K	10 KG	0.1g		
ES-16K	16 KG	0.1g	330×380mm	◆ High precision & fast response ◆ Function of being connected with exteral displayer ◆ Check weighing,the limits of weight could be setup ◆ Optional independent displayer and stainless displayer support with adju stable angle, height and position when connected
ES-30K	30 KG	0.1g		
ES-60K	60 KG	0.5g		

Bench Scale

TC-K series bench scales have bigger weighing range, high precision, and they are very suitable for high durability and reliability weighing fields

- Aluminum scale frame, with plastic shell.
- Big high resolution LCD display with backlight
- Counting fuction: Reference Number→1/10/20/50/100）
- Strain sensor, stainless steel weighing plate
- Come with standard RS232 interface, can connect printer and computer.
- Rechargeable, both AC and DC can be used
- 2 Weighing units: KG / lb
- Automatical calibration



Technical Item → Ordering Information ↓	Max.Weight （KG）	Resolution （g）	Plate Size （mm）
TC 60K	60	1	520×420
TC 60KA	60	5	500×400
TC 150K	150	5	520×420
TC 150KA	150	20	500×400
TC 300K	300	10	520×420
TC 300KA	300	50	500×400
TC 600KA	600	100	500×400

High Precision Oven

BGD 801 Series Precision Ovens are independently designed and manufactured by our company for laboratories with stringent temperature control requirements. Conventional ovens available on the market suffer from a common industry defect: concentrated hot spots and hidden cold zones. The temperature difference between different positions inside the chamber (e.g., top and bottom layers) can exceed 15℃ at maximum. This causes inconsistent drying within the same batch of samples—Over-drying in partial areas and incomplete drying in others—leading to distorted experimental data and unstable batch-to-batch product quality.

This series adopts a high-precision PID temperature controller to accurately regulate the heating power of electric heating tubes, maintaining an accurate, uniform and stable high-temperature environment throughout the chamber with a temperature deviation≤2℃. It enables even and rapid evaporation of moisture from test pieces for efficient material drying. Featuring superior temperature control accuracy, minimal temperature overshoot and slight fluctuation, the ovens are widely applicable to high-precision testing and advanced process scenarios.

Features:

- **3D Circulating Air Duct System:** Equipped with innovative diversion air ducts and industrial centrifugal fans to generate three-dimensional circulating hot airflow. Air dead zones at corners are eliminated, and hot air flows evenly across every shelf. The measured temperature difference between any two points is ≤2℃ at 100℃, outperforming the national standard GB/T 30435 which specifies a maximum tolerance of ±2.5% of the full scale range.
- **Premium Thermal Insulation Structure:** Constructed with thickened high-quality ceramic fiber insulation featuring ultra-low thermal conductivity, combined with a fully sealed chamber design. The set temperature can be rapidly restored after door opening to guarantee uninterrupted processing cycles.
- **4.3-inch Touch Screen:** Real-time display of parameters including temperature and runtime.
- **Programmable Operation:** Supports up to 8 preset programs, each containing a maximum of 8 segments with configurable temperature and duration.
- **304 Stainless Steel Inner Chamber with Mirror Polished Surface**
- **Anti-tilt Adjustable Shelves:** Shelves will not fall out when pulled halfway out; shelf heights are freely adjustable to suit diverse samples.
- **Temperature Test Port at the Top of the Chamber**
- **Scheduled Startup & Timing Functions**
- **Switchable Temperature Units (℃/℉)**
- **Over-temperature Protection:** The power supply to heating tubes will be automatically cut off once the internal temperature exceeds the equipment's upper limit.
- **Standard USB Port; RS485 Interface Available as an Option**
- **Optional Independent High-limit Temperature Alarm System:** Audible and visual alarms activate when the temperature exceeds the preset threshold.







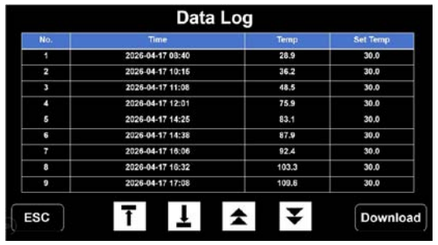
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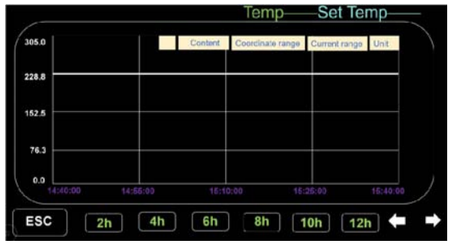
Edit Program Segments



Ordering Information → Technical Item ↓	BGD 801/1 High Precision Oven	BGD 801/2 High Precision Oven	BGD 801/3 High Precision Oven
Interior Volume	30L	50L	90L
Settable Tem. Range	RT+10℃~300℃		
Temperature Resolution	0.1℃		
Temperature Uniformity	≤2.0℃		
Temperature Fluctuation	±0.5℃		
Standard Quantity of Shelves	2		
Maximum Number of Shelves	6	9	11
Shelf Load Capacity	20kg		
Net Weight	43 kg	51 kg	75 kg
Settable working time	(1–5999)mins		
Interior Dimension（W×H×D,mm）	320×320×290	400×400×360	450×450×440
Overall Dimension（W×H×D,mm）	620×560×550	690×640×600	750×700×680
Rated Power	950W	1250W	1450W
Electrical Supply	AC220V,50Hz		



Data Storage Interface



Curve Interface

Precise Oven

BGD Series Precise Ovens with forced convection focused on addressing the requirements involved in drying or heating samples. With high quality and reliability, high cost performance, outstanding temperature accuracy, Biuged brand ovens has become the first option for many laboratories.

Features:

◆ Microprocessor PID temperature controller with temperature control protection, digits display and timing function ensures a precise and reliable temperature control.（intelligent programmable LCD temperature controller is an option）

◆ Hot-air circulating system consists of a fan keeping running under a high temperature and proper air ducts to ensure a uniform distribution a high temperature in chamber

◆ Independent alarm system for temperature-limiting ensures experiments run safely and no accident would happen.（Option）

◆ Recorder and printer are options which can print or record set Parameters and trace variation curves of temperature.（Option）

◆ Can equip explosion-proof or vacuum （Option）



Main Technical Parameters：
★ Working Room Material： High quality stainless steel by argon–arc–welding technology
★ Temperature Stability： ±1℃
★ Temperature Control： 0.1℃
★ Timing Range： 1～9999min

Technical Item → Ordering Information ↓	Electrical Supply	Temperature Range	Power	Cubage	Interior Dimension (mm) W×D×H	Overall Dimension (mm) W×D×H	Shelves
BGD 802	220V 50HZ	RT+10–250℃	850W	30L	340×320×320	620×440×490	2 pcs
BGD 804	220V 50HZ	RT+10–300℃	850W	30L	340×320×320	620×440×490	2 pcs
BGD 806	220V 50HZ	RT+10–300℃	1100W	50L	420×395×350	720×530×520	2 pcs
BGD 808	220V 50HZ	RT+10–250℃	1550W	80L	450×400×450	740×530×630	2 pcs
BGD 810	220V 50HZ	RT+10–300℃	1550W	80L	450×400×450	740×530×630	2 pcs
BGD 812	220V 50HZ	RT+10–250℃	2050W	136L	550×450×550	840×580×730	2 pcs
BGD 814	220V 50HZ	RT+10–300℃	2050W	136L	550×450×550	840×580×730	2 pcs
BGD 816	220V 50HZ	RT+10–250℃	2450W	220L	600×500×750	880×630×930	2 pcs
BGD 818	220V 50HZ	RT+10–300℃	2450W	220L	600×500×750	880×630×930	2 pcs
BGD 820	380V 50HZ	RT+10–250℃	3100W	420L	640×585×1355	780×730×1780	3 pcs
BGD 822	380V 50HZ	RT+10–300℃	3100W	420L	640×585×1355	780×730×1780	3 pcs
BGD 824	380V 50HZ	RT+10–250℃	4000W	620L	840×600×1355	980×800×1880	4 pcs
BGD 826	380V 50HZ	RT+10–300℃	4000W	620L	840×600×1355	980×800×1880	4 pcs
BGD 827/1	380V 50HZ	RT+20–400℃	3250W	50L	350×350×400	890×700×920	2 pcs
BGD 827/2	380V 50HZ	RT+20–500℃	4050W	50L	350×350×400	890×700×920	2 pcs
BGD 828/1	380V 50HZ	RT+20–400℃	4050W	100L	450×450×450	990×790×990	2 pcs
BGD 828/2	380V 50HZ	RT+20–500℃	4900W	100L	450×450×450	990×790×990	2 pcs
BGD 829/1	380V 50HZ	RT+20–400℃	4900W	220L	600×600×600	1140×950×1140	2 pcs
BGD 829/2	380V 50HZ	RT+20–500℃	6050W	220L	600×600×600	1140×950×1140	2 pcs

Biuged also offers all size ovens with vacuum or explosion-proof function

High-Temperature Oven （Muffle Kiln）

The new generation box resistance oven is integrated with the Company's years of experiences in design and manufacturing as well as foreign technologies. It is of various design patents and is especially supplied to the laboratories of factories, mines, universities and scientific research institutions for chemical element analysis and such high-temperature treatment as quenching, annealing and tempering of small castings. It can also be used for such high-temperature heating as baking, dissolving and analyzing of metals, graphite and ceramic.

Features of Product

◆ Unique design of oven door for safe and easy operation to ensure that the high-temperature hot gas will not escape for inside the oven.

◆ Inert gas inlet and outlet reserved in the chamber.

◆ Micro-computer PID Controller: easy operation, accurate, reliable and safe control.

◆ Inside lining of fire-door and box panel are both made of stainless steel materials and are featured for corrosion-resistance and free deformation under high temperature.

◆ Light chamber for durable service (refractory-brick chamber and ceramic-fiber chamber are optional)

◆ With excellent door seal, thermal loss is minimized and temperature evenness is increased in the chamber.



Optional: 30-segment programmable controller

(each segment can setup “heating” or “stop” and the circulation of programmed temperature, time heating power is provided.)



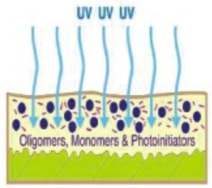
Technical Item → Ordering Information ↓	Max Temp(℃)	Working-room Size W×D×H(mm)	Capacity	Power	Input Power	Heating Element
SX2–2.5–10	1,000	200×120×80	2L	220V/50Hz	2.5 kW	Heating cord
SX2–4–10	1,000	300×200×120	7L	220V/50Hz	4 kW	Heating cord
SX2–8–10	1,000	400×250×160	16L	380V/50Hz	8 kW	Heating cord
SX2–12–10	1,000	500×300×200	30L	380V/50Hz	12 kW	Heating cord
SX2–2.5–12	1,200	200×120×80	2L	220V/50Hz	2.5 kW	Heating cord
SX2–5–12	1,200	300×200×120	7L	380V/50Hz	5 kW	Heating cord
SX2–10–12	1,200	400×250×160	16L	380V/50Hz	10 kW	Heating cord
SX2–4–13	1,300	250×150×100	4L	220V/50Hz	4 kW	Heating cord
SX2–8–13	1,300	500×200×180	18L	380V/50Hz	8 kW	Heating cord
SX2–8–16	1,600	300×150×120	5.4 L	380V/50Hz	8 kW	Globar
SX2–12–16	1,600	400×200×160	13 L	380V/50Hz	12 kW	Globar
Remarks	① For every chamber, we offer two types inner material, one is “refractory–brick” marked with “N”, the other is “ceramic–fiber” marked with “T”, please mark it when you place order. ② Optional accessory: Programmable controller with 30–segments or 60–segments					

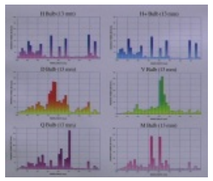
UV Solidify Machine

UV Solidify Machine is used widely for UV paint, UV glue, UV inks, UV gloss ink; It is small, economic and practical as it's selling point, suit for small batches, trial production or used in small enterprise and also is welcomed in painting, glue manufacturers for research and development.

- Portable and small with one UV lamp installed, which is suitable for operation line and also handwork
- Easy to operate; one of mass production models, components selected are standardized; simple operation and maintenance with low cost
- Reasonable exhaust design with effective cooling system
- Speed can be set free within the effective scope







Ordering Information → / Parameters ↓	BGD 8212	BGD 8213	BGD 8314	BGD 8223	BGD 8324
Power supply	220VAC/50HZ				
Total power	2.2KW	2.2KW	3.2KW	4.2KW	6.2KW
UV lamp Power	2KW	2KW	3KW	2KW	3KW
Lamp Quantity	1 PC	1 PC	1 PC	2 PCS	2 PCS
Belt Moving Speed	0–10 m/min		0.5m/min–8 m/min		
Belt Material	Stainless steel or TEFLON				
Belt Width	200mm	300mm	400mm	300mm	400mm
Entrance Height	0～100mm				
Cooling Method	Air Cooling				
Main Wavelength	200nm～450nm（Wave Crest 365nm）				
Lamp Life	800h～1,000h（after 600 hours, the light attenuation≤ 75%）				
UV lamp type	High–pressure mercury lamp, 100w/cm				
Overall size (L×W×H,mm)	1250×440×1200	1250×540×1200	1000×650×1520	1200×550×1520	1500×650×1550
Net Weight (kg)	80	90	150	180	250

We also accept the special custom-made UV Solidify machine order!!

LED UV Solidify Machine

Compared to traditional ultraviolet (UV) solidifymachines that use mercury or gallium lamps as light sources, those solidify machines that uses LED as light sources has several distinct advantages, including longer lifetime, environmental friendliness (no ozone production), energy efficiency, and no significant heat emission during operation.

Currently, LED light sources at wavelengths of 365nm and 395nm are primarily used. Within these wavelengths, the light emission intensity of LED is much greater than that of mercury lamps, which is beneficial for the deep curing of UV materials. At the same time, the heat generated by LED lighting is dissipated from the back, with no heat on the lighting side itself, thus avoiding any temperature effects on the curing materials.

On the other hand, LED emit narrow bandwidth light, which allows for precise curing (including the precise curing of specific parts of materials, such as in 3D printing; or adjusting the irradiation distance to achieve a certain degree of curing of the material).



Ordering Information→ / Technical Item ↓	BGD 8200/A LED UV Solidify Machine	BGD 8200/B LED UV Solidify Machine	BGD 8400/A LED UV Solidify Machine	BGD 8400/B LED UV Solidify Machine
Wavelength	365nm	395nm	365nm	395nm
Lighting Size	100mm×200mm		100mm×400mm	
Belt Width	200mm（Teflon）		400mm（Teflon）	
Moving Speed	0.5m/min～8m/min（adjustable）			
Irradiance Energy[1] （mW/cm²）	800（UVA） 230（UVV）	60（UVA） 1200（UVV）	800（UVA） 230（UVV）	60（UVA） 1200（UVV）
Adjustable Power	10%～100%（knob–style）			
Lighting Distance	10mm～100mm（adjustable）			
LED Lifetime	20000h			
Heat Dissipation	Forced air cooling			
Power Supply	AC 220V, 50&60Hz			
Total Power	500W		1000W	
Overall Size（L×W×H）	1000mm×410mm×660mm		1000mm×610mm×790mm	
Remarks	1. These data is measured by UV Power PUCK liproduced by USA EIT company under 20mm lighting distance. 2. Wave peak range: UVA→320~390nm; UVV→395~445nm			

UV Integrator (UV Radiometer Dosimeter)

The UV-Integrator is a high quality UV measuring instrument. It is used to measure UV energy of different light-sources, especially on printing machines and UV solidify machine. It is ideal to ensure quality control of printing and drying processes.

It is measuring an integral in the spectral range from 250nm~410 nm or 340nm~420nm, with a pack at the area of 365 nm or 395nm.

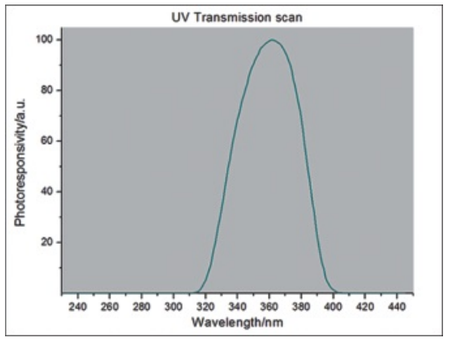
By addition of the incidence of the light quantities during the exposure cycle, relative values are calculated.

Because of uneven radiation distribution of the UV light source and different type of construct-ion of the measuring devices by different manufacturers, different readings may appear under the same measurement conditions.

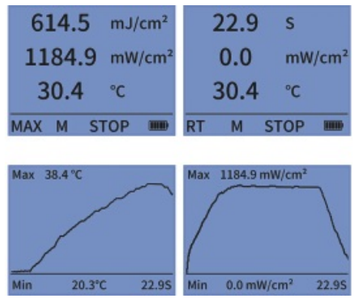




Ordering Information→ Parameter ↓	BGD 140 UV Integrator	BGD 142 UV LED Integrator
Suitable Light Source	High–Pressure Mercury Lamp& Halogen Lamp	UV LED Lamp
Spectral Response Range	250nm ~ 410nm, λ p = 365nm	340nm ~ 420nm, λ p = 395nm
Measurement Power Range	0 ~ 5,000 mW/cm²	0 ~ 40,000 mW/cm²
Measurement Energy Range	0~ 999, 999mJ/cm²	
Power Resolution	0.1 mW/cm²	1 mW/cm²
Power Curve	No	Yes
Temperature Range	No	–55℃ ~ 125℃
Power Supply	3V Lithium Battery （Replaceable）	2 AAA Alkaline Batteries
Overall Size	ϕ95mm; Thickness is12mm	ϕ120mm; Thickness is13mm
Net Weight	160 g	245 g
Work Environment	While on the conveyer belt, it can withstand max.110℃ for up to 10 seconds	
Suggested Calibration Period	One year	



BGD142 Spectral Response Curve



Simultaneous measurement of energy, power, and temperature with display of power curve and temperature curve (BGD 142)

Four-Band UV Integrator

The **BGD 144 Four-Band Intergrator** simultaneously measures UV energy, UV intensity, temperature, and irradiation duration across four spectral bands. It is suitable for comprehensive UV intensity testing in various applications, including UV curing machines, UV drying systems, smartphone UV coating machines, exposure units, printing presses, and more. Compatible with multiple UV light sources such as high-pressure mercury lamps, halogen lamps, gallium lamps, iron lamps, and xenon lamps.

Features:

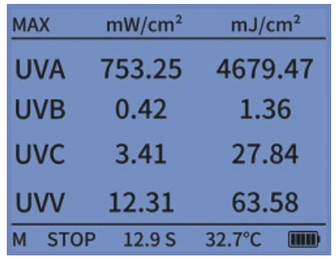
- Simultaneous measurement of UVA, UVB, UVC, and UVV energy & intensity
- Real-time monitoring of temperature & UV power with graphical display
- Ultra-high-speed sampling at 2048 times/second for precise measurements
- Built-in timer for accurate curing duration recording
- High-precision temperature sensor for dynamic temperature measurement in curing environments
- High-temperature resistance stable operation in 100℃ environments
- PC software included for data export and report generation

Main Technical Parameters：
★ Spectral Range: UVC (230~280nm； λ p=254nm)； UVB (280~315nm； λ p=310nm)； UVA (315~400nm； λ p=365nm)； UVV (395~445nm； λ p=420nm)
★ Power Measurement Range: 0 ~ 2000 mW/cm²
★ Power Resolution: 0.01 mW/cm²
★ Energy Measurement Range: 0 ~ 999,999 mJ/cm²
★ Energy Accuracy: ±0.5 mW/cm² (H <5 mW/cm²)； ±10% (H ⩾5 mW/cm²)
★ Sampling Rate: 2048 times/sec
★ Power Data Logging Rate: 32 times/sec
★ Temperature Logging Rate: 2 times/sec
★ Max Recording Duration: 32 minutes
★ Measurement Units: μW/cm², mW/cm², W/m²
★ Dimensions: 120 mm (diameter)
★ **Ordering Information:** BGD 144–––Four–Band UV Integrator

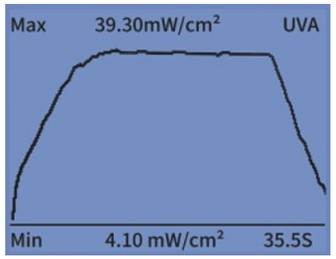


Large LCD Screen

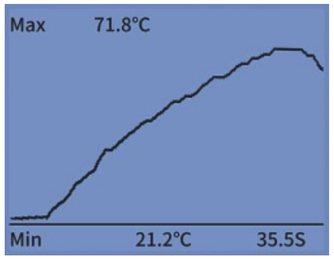
Equipped with a spacious LCD display that shows UV power and temperature in real time, along with clear graphical test curves and peak values.



Maximum Value Interface



Power Curve Interface for Each Band



Temperature Curve Interface

Digital Water Bath

Provided to colleges,industrial and mining enterprises and scientific research departments for precise constant temperature and auxiliary heating.

Features:

- The housing is integrally molded with ABS material, resistant to acid, alkali, and corrosion;
- Seamless stainless steel inner tank with adjustable beaker hole size;
- High-precision microcomputer controller ensures precise and reliable temperature regulation;
- Over-temperature sound and light tracking alarm for reliable sample protection;
- Dry-burn protection (requires manual start/stop for reset) to prevent accidents;
- Five-button control eliminates risks associated with automatic restart;
- Lightweight design with optional independent temperature limit protection.



2 holes 4 holes 6 holes 8 holes



Ordering Information → Technical Item ↓	BGD 830 (1 column 2 holes)	BGD 831 (2 column 4 holes)	BGD 832 (2 column 6 holes)	BGD 833 (2 column 8 holes)
Power Supply	AC220V 50HZ			
Input Power	500W	1,000W	1,500W	2,500W
Temperature Range	RT+5 ~ ±99℃			
Temperature Stability	±0.5℃			
Tracking Alarm	±2℃			
Capacity	5L	10.8L	24.8L	24.8L
Inner Size (mm) W×D×H	300×155×150	300×240×150	500×300×150	500×300×150
Overall Size (mm) W×D×H	345×210×280	345×295×280	550×360×280	550×360×280
Note	① Each hole has 5 circles (Φ32, Φ52, Φ72, Φ92, Φ112) for BGD 830 and BGD 832; ② BGD 831 has 4 holes, two of them is 5 circles (Φ32, Φ52, Φ72, Φ92, Φ112) ; the other two is 4 circles (Φ32, Φ52, Φ72, Φ92) ; ③ BGD 833 has 8 holes, four of them is 5 circles (Φ32、Φ52、Φ72、Φ92、Φ112) ; the other four is 4 circles (Φ32, Φ52, Φ72, Φ92)			

Digital Heating Bath

The water resistance test of the paint film requires the liquid medium to maintain a constant specified temperature, which can be achieved using an electric thermostatic water bath.

Features:

- New exterior design (BGD 836-837-838 features stainless steel construction, resistant to acid/alkali corrosion), produced with precision mold technology;
- Seamless stainless steel inner tank for durability;
- Digital display & microcomputer control, equipped with a timer function;
- Dry-burn protection (manual start/stop reset required) to prevent accidents;
- Five-button control eliminates risks associated with automatic restart;
- Over-temperature sound and light alarm ensures reliable sample protection;
- Optional independent temperature limit protection for added safety.



BGD 834



BGD 835

Technical Item→ Ordering Information ↓	Temp. Range		Capacity	Temp. Resolution/ Temp. Stability	Interior Dimension (mm) W×D×H	Overall Size (mm) W×D×H
BGD 834	RT+5~99℃	500W	15L	0.1℃/ ±0.5℃	330×300×160	570×350×260
BGD 835		1000W	28L		600×300×160	750×350×300
BGD 836		600W	15L		330×300×160	460×340×190
BGD 837		800W	21L		450×300×160	610×340×260
BGD 838		1,000W	28L		600×300×160	760×340×280

Low-high Temperature Circulating Bath

BGD series low-high Temperature Circulating Bathes are all in one that heat and cool, it offer an economical solution for putting sample to bathes for constant temperature testing and widely be used for controlling temperature to sample, testing for material, quality controlling and analysis.

- Water-proof operation panel, high-lighted four digitals LED, 0.1℃ showing precision. The equipment can show all kinds of working status, such as heating, cooling, circulating, controlling for external temperature.
- The whole bath body is made of stainless steel, and use insulation cotton to insulate and keep temperature; water bath and cooling tubes are also made of corrosion-resistance SUS 304 stainless steel, don' t produce verdigris and rusting even long use.
- Can control heating-cooling or circulation function separately or simultaneously,
- Three methods for setting temperature: 1- Press button to increase or decrease at 0.1℃ step; 2- press button for longer time to increase or decrease temperature quickly; 3- Move cursor quickly, change setting values directly.

◆ High efficiency compressor combines PID control technology, more energy-efficient, temperature is stabler (±0.05)

◆ With single point calibration function, the user can calibrate the temperature of some point

◆ Immersion pressure & suction pump, pressure part pumps out liquid, suction part pump in liquid, achieve a multi-prupose

◆ Small open size is convenient for using external circulating application

1）Closed external circulating function: the equipment is equipped a special pump for external circulation and can be used for keep constant temperature for a closed external circulation, such as reaction still, condenser pipes.

2）Open external circulating function: With controller for liquid level, the equipment can achieve a constant temperature circulation to those containers which has a big opening size and test more samples.

Note: Standard M16×1 connection nets, can use different joints for different pipe diameters of external containers.

◆ Three operation modes for option under this situation: the power is off accidentally while the equipment is working, when the power is on again: Mode Ⅰ --The equipment won' t work and the setting value can be changed; Mode Ⅱ-- The equipment will work automatically and the setting values can be changed: Mode Ⅲ--The equipment would run automatically and the setting values can’ t be changed.

◆ Use environment friendly, natural cooled methods, conforms to safety grade III and DIN 12876

◆ Double safety protection: The first one is liquid level, when the liquid level is low, the equipment will reminder the user to add liquid and it will stop working if no adding liquid; The second one is setting the limiting values of high temperature and low temperature, the equipment would alarm and stop working when working temperature exceeds the setting values（use only non-combustible liquid）. The user can find problems directly by the shown alarming codes. The voice of alarm buzzer can be set on or off

◆ Small size, and with handles in the back and forth, user can move the equipment more convenient. The equipment can be put on desk, in fume hoods or on the ground directly.

◆ The optional extended functions as below:

① Middle-grade PID control technology, 5 figures LED, 0.1℃ display accuracy, higher control precision—reach to±0.03℃

② RS 485 or RS 232 interface to accomplish: 1）Get telecommunication by digital signals, 0-10V, 4-20mA analog signals and switching signals, control turning on or off the equipment; 2）Monitor the working status of equipment; 3）Working with host computer on-line

③ 3kW heater to rise temperature more quickly

④ Control external temperature, with moveable external temperature sensor PT 100, the user can control external temperature precisely.

⑤ Monitor software for external temperature--Lab Temp. Show temperature curve in PC, record and export data.

⑥ Moveable vehicle, place and move the equipment more convenient.



BGD 845 Vertical Type



BGD 846 Horizontal Type

Technical Items → Ordering Information ↓	Temp. Range, (℃)	Temp. Fluctuation (℃)	Temp. Resolution (℃)	Capacity (L)	Open Size (L×W, mm)	Overall Size (L×W×D, mm)	Pump Flux (L/min)
BGD 845/1008	−10 ~ 100	±0.05	0.1	8	166×140	230×400×615	12
BGD 845/1020	−10 ~ 100	±0.05	0.1	20	295×297	350×570×778	22
BGD 845/0520	−5 ~ 100	±0.05	0.1	20	295×297	350×570×778	22
BGD 845/2005	−20 ~ 100	±0.05	0.1	5	166×38	230×400×615	12
BGD 845/2020	−20 ~ 100	±0.05	0.1	20	295×297	350×570×778	22
BGD 845/3005	−30 ~ 100	±0.05	0.1	5	166×38	350×450×720	22
BGD 846/1008	−10 ~ 100	±0.05	0.1	8	175×145	415×410×426	12
BGD 846/2008	−20 ~ 100	±0.05	0.1	8	175×145	415×410×426	12

Note: *Biuged also accepts any special customized bath, including different temperature range（low or high）or different capacity.*

Laboratory Freezers

Laboratory Freezers are designed to test the freeze-thaw-resisting test of paint or temperature variation resisting test of film.

Main Technical Parameters：
★ Microprocessor temperature control
★ Digital temperature display
★ Alarms for over temperature and under temperature
★ Malfunction alarms for over/under temperature, and sensor error
★ Alarm signals audible and flashing
★ Highly efficient deafness compressor
★ CFC−free refrigerants
★ High density insulation with excellent insulation properties
★ Superior cooling performance with optimized evaporator and condenser
★ Drawer designs for convenience of storing and accessing materials
★ LED digital temperature display for easy observation
★ Wide applicable voltage tolerance of 187 VAC to 242 VAC
★ Door handle design for easy operation
★ Casters for easy moving unit



Horizontal



Vertical

Technical Item → Ordering Information ↓	Temperature Range（℃）	Volume（L）	Working Room Size（mm） L×W×H	Overall Size（mm） L×W×H
DW−25L92	−10 ~ −25	92	435×410×635	597×610×860
DW−40L92	−20 ~ −40	92	435×410×635	597×610×860
DW−25W198	−10 ~ −25	198	802×387×696	940×560×845
DW−25W 388	−10 ~ −25	388	1114×529×690	1240×745×845
DW−25L262	−10 ~ −25	262	480×462×1430	657×685×1665
DW−40W100	−20 ~ −40	100	500×385×625	680×600×805
DW−40W255	−20 ~ −40	255	1040×430×605	1243×633×838
DW−40W380	−20 ~ −40	380	1376×457×625	1550×633×838
DW−40L278J	−20 ~ −40	278	520×435×1230	736×660×1810
DW−40L348J	−20 ~ −40	348	535×650×1228	715×840×1860

Note：“L” indicate Vertical；“W” indicate Horiztontal

Condensation-water Tester

For some polymer materials used in outdoor, enough experience indicates the corrosion caused by moisture （especially by condensation） is more serious than any other factor. So, testing coating film resistance to humidity is an important method to evaluate coating corrosion resistance.

ISO 6270：2007 series standards are test method standards which are used to evaluate the coatings film resistance to humidity, consists of three parts as below:

Part 1: Paints and varnishes **--** Determination of resistance to humidity **--** Part 1: Condensation (single-sided exposure)

Part 2: Paints and varnishes **--** Determination of resistance to humidity **--** Part 2: Condensation (in-cabinet exposure with heated water reservoir)

Part 3: Paints and varnishes **--** Determination of resistance to humidity **--** Part 2: Condensation (in-cabinet exposure with heated and bubble water reservoir)

In order to meet the needs of different fields and customers, **BIUGED INSTRUMENTS** designs and manufactures different types condensation-water Climatic Chambers according to different standards.

Single-sided Exposure Condensation Chamber

BGD 875 Single-sided Exposure Condensation Chamber offers a test condition for determining the resistance of paint films, paint systems and related products to conditions of condensation in accordance with the requirements of coating or product specifications.

It is applicable to coatings, both on porous substrates such as wood, plaster and plasterboard and on non-porous substrates such as metal. It provides an indication of the performance likely to be obtained under severe conditions of exposure where continuous condensation occurs on the surface. The procedure can reveal failures of the coating (including blistering, staining, softening, wrinkling and embrittlement) and deterioration of the substrate.

This tester is fast, easy to use and affordable. It uses 100% condensing humidity to simulate and accelerate damage caused by rain and dew on metals, paints, and organic materials. It accelerates over natural exposures by increasing moisture temperature. The tester replaces water immersion and ordinary (non-condensing) humidity tests.

◆ Operator can set three different working conditions: humidification, natural cooling, dry and its corresponding temperature & running time. Any program including total test time and cycle times can be set freely.

◆ Automatic water supply

◆ Protector for water temperature ceiling

Main Technical Parameters：

★ The angle between test panel and the level ： （60±5）°

★ Test Specimens Capacity：40 pcs
（150mm×70mm standard size）

★ Temperature Range of Working Room：RT~60°
（Dry or condensation）

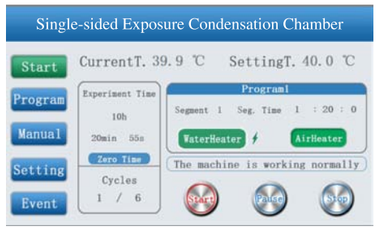
★ Overall Size：1350mm×550mm×1295mm（L×W×H）

★ Weight：130 kg

★ Power：220V 50Hz/60Hz；Max. power of machine：2.0kW

★ **Ordering Information:**

BGD 875---Single-sided Exposure Condensation Chamber



Operation Menu





In-cabinet Exposure Condensation Chamber

BGD 876 In-cabinet Exposrue Condensation Chamber is designed according to ISO 6270-2《Paints and varnishes -- Determination of resistance to humidity -- Part 2: Condensation (in-cabinet exposure with heated water reservoir)》. This standard is different with Part 1 "Continuous condensation", but defines three cyclic program: CH (Condensation atmosphere with constant humidity), AHT (Condensation atmosphere with alternating humidity and air temperature), AT (Condensation atmosphere with alternating air temperature) to simulate different humidity environment.

It can give much better supplements and explanation for corrosion degree and defect types of coating used in different environment. Comparing to Part 1---single-sided exposure, this method add a condensation atmosphere with alternating humidity and air temperature, and mainly used to evaluate paints anti-corrosion ability under different environment.

Condensation Test Atmospheres

Test Atmosphere			Cycle Duration		Conditions in working chamber after reaching equilibrium	
Type		Code	Test Period（s）	Total	Air Temperature	Relative Humdity
Constant-humidity condensation atmosphere		CH	From warm-up to end of exposure	---	（40±3）℃	Approx.100% with condensation on test specimens
Alternating condensation atmosphere	With alternation of humidity and air temperature	AHT	8h including warm-up	24h	（40±3）℃	Approx.100% with condensation on test specimens
			16h including cooling down（chamber open or ventilated）		18℃ to 28℃	Approaching ambient
	With alternation of air temperature	AT	8h including warm-up	24h	（40±3）℃	Approx.100% with condensation on test specimens
			16h including cooling down（chamber closed）		18℃ to 28℃	Approx.100%（approximately saturated）

◆ Designed with automatic ventilator, can control chamber ventilation automatically.

◆ Operator can set three different working conditions: humidification, cooling with ventilation, cooling without ventilation and its corresponding temperature & running time. Any program including total test time and cycle times can be set freely.

◆ Automatic water supply

◆ Protector for water temperature ceiling

◆ Real-time display of relative humidity inside the working chamber

◆ A glass observation window is designed in chamber, operator can observe specimens test status directly.

Main Technical Parameters：

★ Test Specimens Capacity：20 pcs
（150mm×70mm standard size）

★ Temperature Range of Working Room：RT~60°
（Dry or condensation）

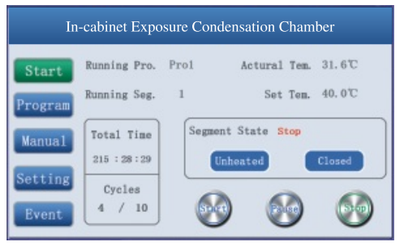
★ Overall Size：800mm×750mm×1420mm（L×W×H）

★ Weight：180 kg

★ Power：220V 50Hz/60Hz；Max. power of machine：2.0kW

★ **Ordering Information:**

BGD 876 ---In-cabinet Exposure Condensation Chamber



Operation Menu



High-Low Temperature & Humidity Cabinet (Climate Chamber)

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.

Biuged launched the latest generation climate chambers which has the following updates compared to previous products or competitors prodcuts:

① The refrigeration control system adopts an electronic expansion valve to control the cold end balance, which, under the same test conditions, can save at least 40% power compared to products using thermal balance methods. It also reduces water consumption by more than 60%.

② 408L chambers and above are equipped with Copeland scroll compressors, offering greater cooling capacity and lower noise levels. The remaining models use European-made low-temperature refrigeration compressors.

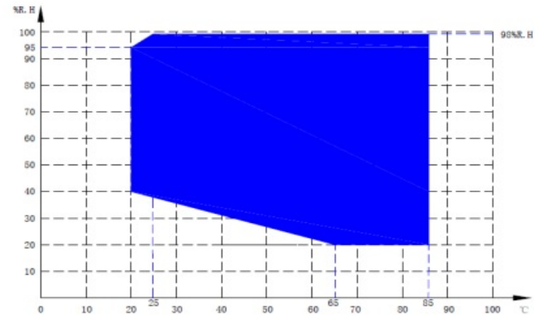
③ Can choose electronic humidity sensors（optional）to control and display the relative humidity of the working room, more convenient, more accurate. This new design avoids many inconveniences and issues come from the previous method of using PT 100 platinum resistance for wet and dry bulb measurements. For example there is no need to regularly replace the wet bulb fabric, and some users may forget to replace it or hang it incorrectly, resulting in wrong humidity readings or the inability to control humidity during the test.







Main Technical Parameters：
★ Temperature Uniformity： ±2 ℃
★ Humidity Stability： ±2 %RH
★ Temperature Stability： ±0.5℃
★ Humidity Uniformity： ≤ 2%～3% Rh (≥ 75%RH)
or ≤ ±5% RH (≤75% Rh)
★ Temperature Increasing Rate： ≥ 3.5℃ / min
(no-load, average value during the whole test)
★ Temperature Decreasing Rate： ≥1℃ / 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℃	20～98%	4.6KW/16A	400×500×500	900×1400×1150
BGD 897/100C	-40～150℃				
BGD 897/100D	-60～150℃				
BGD 897/225B	-20～150℃		5.5KW/22A	500×750×600	1000×1650×1250
BGD 897/225C	-40～150℃				
BGD 897/225D	-60～150℃				
BGD 897/608B	-20～150℃		11KW/12A (380V; 3 phase and 4 wires)	800×950×800	1300×1850×1400

Biuged also accept any customized climate chamber (different size and temperature) !!

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

Structure and Features

1.0 Structure	
Chamber Inner Material	Made of SUS304# stainless steel plate, cut with precision laser cutting equipment and formed with CNC bending machines, then fully welded with argon arc welding, polished, and finished. The steel plate thickness is 1.2 mm. Both sides of the inner chamber are equipped with sample tray support indexing racks, allowing adjustment of the spacing between sample trays.
Chamber Outer Material	Made of 1.2 mm cold-rolled steel plate (SUS304# stainless steel plate is also optional), cut with precision laser cutting equipment and formed with CNC bending machines, then welded with argon arc welding, polished, and finished. After overall acid washing and rust removal, the steel plate surface is treated with high-temperature baking paint, offering a more aesthetically pleasing appearance and enhanced anti-corrosion and rust-proof performance compared to conventional surface spraying.
Chamber Door	Single-opening door with explosion-proof handle. Anti-condensation electric heating device. Observation window with anti-condensation function (size 230?270 mm, made of transparent electrically heated film laminated tempered glass) and observation window lighting. Door sealing uses specially customized high-temperature resistant, non-toxic, ultra-flexible silicone sealing strips.
Air Circulation System	Built-in air plenum, circulation ducts, and stainless steel circulation fan. Air is evenly distributed from the top through louvered windows and diffusers, dispersing the temperature and humidity conditioned in the mixing chamber into the test space. This effectively ensures uniform temperature and humidity on the surface of test samples.
Insulation System	Insulation material made of rigid polyurethane foam + fiberglass wool, with a thickness of 100 mm. This provides superior thermal insulation compared to ordinary insulation materials, saving energy and reducing the impact on the ambient temperature around the equipment.

Drain Hole	A drain hole is located at the bottom of the inner chamber to quickly discharge condensed water.
Pressure Relief Port	A pressure relief port is installed near the edge of the top of the chamber to automatically release pressure when internal air expands.
Test Port	One ϕ 50 mm test port is located at the center of the left side of the chamber, complete with corresponding thermal insulation accessories and a dedicated sealing plug.
2.0 Electrical Control System	
Controller	7–inch high–definition (resolution 1024 × 600) TFT true–color LED touch screen, separately controlling temperature and humidity inside the chamber, directly displaying set values (SV) and actual values (PV). ① Editable program capacity: Up to 100 groups; each program can consist of 1 to 100 segments, totaling 1,000 segments. Dedicated program editing interface allows input of 4 segment temperature, humidity, and time parameters per page. ② Functions: Editing, clearing, inserting, etc. During program execution, functions such as segment skipping and holding are available. ③ Screen features: Adjustable backlight, settable backlight duration, screen display protection with timed or manual shutdown settings. Functions include program copying, connection, editing experiment titles, PID automatic calculation, and FUZZY control. ④ Power failure recovery mode: Stop/Cold start/Hot start. ⑤ Features: Scheduled startup and shutdown, date and time adjustment, key and screen lock (LOCK) function, standby image viewing capability. ⑥ Display: Current program number, segment, remaining time, cycle count, operation time, and graphical curve display. ⑦ Additional functions: Fault alarm with cause and handling prompts; power failure protection; upper and lower temperature limit protection. ⑧ Language options: Chinese and English. Two operation modes: Program mode / Constant mode. ⑨ Display resolution: Temperature 0.01℃; Humidity 0.1%; Time 1 minute.
Connectivity	Can be connected to a computer for centralized monitoring, data collection, and curve display. Interfaces: RS–232, RS–485, TCP/IP, optional CAN. Supports various human–machine interactions based on MODBUS communication protocol, VNC functionality, optional mobile APP, and remote monitoring.
Recording Capability	Recording intervals can be set from 5 seconds to 999 seconds. Continuous 24–hour operation can store over three years of data (sampling rate: once per minute).
Circulation Fan	Uses a high–temperature resistant long–shaft motor installed outside the workspace, with the shaft extending into the chamber and a stirring fan wheel mounted at the end. Special insulation measures and heat dissipation systems enhance motor safety.
Heater	Nickel–chromium alloy heating wire, highly efficient with an ultra–long service life.
Heating Control Method	The temperature controller sends commands based on set temperature and signals from the temperature sensor inside the test chamber. The heating output is regulated via a logic circuit controlling SSR modules. This method is reliable, contactless, spark–free, long–lasting, noiseless, free of electromagnetic interference, with fast switching speed, strong anti–interference capability, compact size, vibration and impact resistance, explosion–proof, moisture–proof, and corrosion–resistant. It enables direct driving of high–current loads with minimal control signals.
3.0 Refrigeration Control System	
Refrigeration Method	To ensure cooling rate and minimum temperature requirements, the test chamber employs a dual–stage cascade refrigeration system. The cascade system includes a high–temperature stage refrigeration cycle and a low–temperature stage refrigeration cycle, with heat exchange achieved through an evaporative condenser. Air–cooled finned condensers and cooling fans dissipate heat.
Refrigeration System Features	① All system pipelines undergo leak testing with pressurized air at 22 kg. ② Heating and cooling systems are completely independent. ③ Equipped with proprietary technology to prevent damage from reverse flow of high–temperature and high–pressure air into the refrigeration system. ④ All refrigeration system operations are fully controlled by a microcomputer controller. ⑤ A water collection tray is installed under the compressor to collect condensed water from frost formation. ⑥ The compressor includes a PTC temperature sensor for over–temperature protection. ⑦ The compressor includes an oil pressure protector for compressor oil pressure protection. ⑧ High and low–pressure protection devices monitor refrigerant pressure during operation. If pressure exceeds the system's maximum limit or falls below the set minimum, an alarm is triggered immediately, and the power is cut off until the fault is resolved. ⑨ The refrigeration system uses all imported brand components, ensuring reliable quality and system stability.
Refrigerant	Environmentally friendly refrigerants R404a/R23 are used as the cooling medium in the refrigeration system.

Components	European imported low–temperature refrigeration compressor, air–cooled finned condenser, finned tube heat exchanger, and high–temperature copper–brazed plate heat exchanger (small surface area, low energy loss, high heat exchange efficiency).
4.0 Humidification and Dehumidification System	
Humidification and Dehumidification Method	External humidification method; dehumidification achieved by compressor startup; P.I.D control adjusts humidification to achieve the required humidity.
Water Supply Device	Large water tank (with built–in micro water pump; water is replenished only in the tank, and the pump automatically supplies water to the humidification boiler based on water level). Water quality requirement: resistivity ⩾500Ω·m
Water Replenishment Method	The device is equipped with a water replenishment port and a water level observation window. Water can be replenished when the water level is low (automatic water supply is also available as an option, requiring an on–site pure water machine and water supply pipeline)
5.0 Safety Protection System	
Refrigeration System	Compressor overheating, overload, overpressure, and over–temperature protection.
Test Chamber	Extreme over–temperature protection, automatic pressure balance protection, and anti–water accumulation protection at the bottom.
Humidification System	Dry heating protection for humidification heat pipes, abnormal water shortage protection, and short–circuit protection for heating pipes.
Heating System	Extreme over–temperature protection for heating pipes and short–circuit protection for heating pipes.
Power Supply	Total power overload and short–circuit protection; control circuit overload or short–circuit protection.
Circulation Fan	Fan overload, fan short–circuit, and fan reverse rotation protection.
6.0 Installation Environmental Requirements	
Floor and Load-Bearing Capacity	① Solid and Level: The floor must be horizontal and sturdy (typically a concrete floor), capable of supporting the weight of the equipment and its fully loaded samples (which can weigh several tons), to prevent resonance or tilting during operation. ② Levelness: After installation, the unit must be calibrated with a spirit level to ensure absolute horizontal alignment. Otherwise, compressor operation and internal temperature/humidity uniformity may be adversely affected.
Ambient Temperature and Humidity	① Temperature: It is recommended to install the unit in an environment with a constant temperature or minimal temperature fluctuation, ideally between 15℃ and 30℃. Excessively high ambient temperatures increase the load on the refrigeration system, affecting the cooling rate and minimum achievable temperature. Excessively low temperatures may lead to frost formation or difficulty starting the unit. ② Humidity: The ambient relative humidity should be below 85% to prevent moisture absorption, condensation, or rusting of electrical components.
Ventilation and Heat Dissipation	① Adequate Space Ventilation: The heat–generating components of the equipment–especially the compressor and condenser in air–cooled models–require sufficient space for heat dissipation. A stuffy environment can lead to reduced refrigeration efficiency, alarms, or even shutdowns. ② Avoid Heat Sources: Keep the unit away from ovens, furnaces, windows with direct sunlight, or other high–power heat–generating equipment.
Cleanliness	Dust–Free and Free of Corrosive Gases: The environment should be free from excessive dust, metal particles, salt spray, and strong acidic or alkaline gases to prevent corrosion of the chamber, clogging of heat dissipation pathways, or contamination of samples.



Copeland scroll compressors



7–inch high–definitionTFT true–color LED touch screen



Refrigeration compressor from Europe

Multi-functional Cyclic Corrosion Test Cabinets

For most artificial accelerated tests in laboratory, getting a consistent testing result with outdoor is the most important purpose. Prior to cyclic corrosion testing, conventional salt spray（a continuous salt spray at 35℃）, was the most popular way to simulate corrosion in a lab. Because conventional salt spray methods failed to simulate the natural wet/dry cycles of the outdoors, test results frequently provided poor correlation to outdoors. In order to better simulate the complex and changeable external natural environment, cyclic corrosion test has gradually been considered as an important and effective method for the life assessment of industrial products.

The Cyclic Corrosion Test Cabinets is also called CCT&CRH Cabinets. Some industrial products need to be exposed to repeated cyclic salt spray, dry and static environment with high humidity and low humidity. These tests were initially switched between several test chambers manually. The multi-functional Cyclic Corrosion Test Cabinets solves this problem well, and realizes the automatic test of these cycles in a chamber.

In a typical cyclic corrosion cabinet, all specimens are exposed to a series of different environments in a repetitive cycle that simulates the outdoors. Simple cycles, such as Prohesion, may consist of cycling between salt fog and dry conditions. More sophisticated automotive methods may ask for multi-step cycles that incorporate humidity, dry air or condensation, along with salt spray and dry-off.

Within one chamber, users can cycle easily through a series of the most significant corrosion environments. Even extremely complex test cycles can easily be programmed with the controller. Biuged CCT&CRH Cabinets can performsalt spray, Prohesion, and 100% humidity for most cyclic automotive tests.

The Cyclic Corrosion Test Cabinets developed and produced by Biuged sets and controls various parameters through the touch screen, and combines multiple tests such as salt spray corrosion, humidity（high temperature and high humidity, low temperature and low humidity）, air drying（hot drying and air drying）to simulate a variety of cyclic corrosion tests. Of course, special cyclic corrosion test can also be simulated through the combination of other accessories. The instrument can also conduct neutral salt spray test（NSS）, acetic acid salt spray test（AASS）, copper accelerated acetic acid salt spray test（CASS）, water spray test, damp heat test, drying test and standard atmospheric environment test separately.

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*
ISO 11493 *Corrosion of metals and alloys - Accelerated testing involving cyclic exposure to salt mist, "dry" and "wet" conditions*
ISO DIN EN 16151 *Corrosion of Metals and Alloys - Accelerated Cyclic Tests With Exposure to Acidified Salt Spray, "dry" and "wet" Conditions*
ISO 16701 *Corrosion of metals and alloys -- Corrosion in artificial atmosphere -- Accelerated corrosion test involving exposure under controlled conditions of humidity cycling and intermittent spraying of a salt solution*
ASTM B117 *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 B380 *Standard Test Method for Corrosion Testing of Decorative Electrodeposited Coatings by the Corrodkote Procedure*
ASTM G85 - 11 *Standard Practice for Modified Salt Spray（Fog）Testing*
ASTM D1735 *Standard Practice for Testing Water Resistance of Coatings Using Water Fog Apparatus*
DIN 50021 *Salt Spray Testing*

Features

- New structure, the whole body is made of composite plastic steel, super corrosion resistance.

operator can set and control varies testing parameters by 10 inch colorful touch screen.

- Can run Neutral Salt Spray Testing (NSS), Acetic Acid Salt Spray Testing (AASS), Copper-Accelerated Acetic Acid-Salt Spray (Fog) Testing (CASS), Prohesion Testing (Salt Spray + Dry), CCT Testing (Salt Spray + Dry + Humidity).
- All testing data can be stored and download by U disc.
- The temperature of working room is controlled by air heating. The concentration and PH value of the spray solution will not be affected by any factors.
- Equipped with precise metering pump which control accurately and adjust the amount of spraying fog, ensure a stable and same collection amount.
- Equipped with precise electric proportion valve, with precise parameter adjustment and easy setting, equipped with pressure monitoring, abnormal situation alarm and automatic shutdown.
- With imported atomizing nozzles, it has low water consumption, reducing both the consumption and the number of times test solutions need to be prepared.
- Real-time monitor the amount of salt solution and remind or alarm when it's shortage.


imported atomizing nozzles





Ordering Information → Technical Parameters ↓	BGD 885/1 （Salt fog spray）	BGD 885/2 （CCT/Salt fog spray+dry+100% humi.）	BGD 885/3 （CRH/Salt fog spray+dry+settable humi.）
Working Room Size（W×D×H）	1140mm×760mm×700mm		
Working Room Capacity	662 L（including V shape cover）/506 L（no including V shape cover）		
Overall Size（W×D×H）	1830mm×1150mm×1250mm		
Salt Solution Reservoir	120 L（External）		
Temperature Range（Salt Fog）	Rt～60℃		
Temperature Range（Humidity）	---	RT+5℃～60℃	RT+5℃～60℃
Temperature Range（Dwell/without forced air）	Rt～60℃		
Temperature Range（Dry-off/with forced air）	---	Rt～70℃	Rt～70℃
Temperature Uniformity	≤2℃		
Temperature Stability	≤1℃		
Humidity Range	---	95%～100%	20%～100% （via air pre-conditioner）
Max. Specimen Panel Capacity（15cm×7cm）	160 pcs（10 panel racks×16 slots ea）		
Hanging Rods	6 pcs（length 80cm）		
Salt Solution Consumption	（12～15）L/d		
Compressed Air Requirement	（4～8）bar, flow rate≥ 28L/min		
Supply Water Requirement	High Purity Deionized Water（>0.2mpa）, conductivity≤0.1μS/cm		
Power Supply	AC（220±10）V, 50/60Hz, Max. current 16A		380V , 50/60Hz, Max. current 32A

Programmable Salt Spray（Fog）Cabinets

The salt spray test is a standardized test method used to check corrosion resistance of coated samples. Coatings provide corrosion resistance to metallic parts made of steel, zamak or brass. Since coatings can provide a high corrosion resistance through the intended life of the part in use, it is necessary to check corrosion resistance by other means. Salt spray test is an accelerated corrosion test that produces a corrosive attack to the coated samples in order to predict its suitability in use as a protective finish. The appearance of corrosion products (oxides) is evaluated after a period of time. Test duration depends on the corrosion resistance of the coating; the more corrosion resistant the coating is, the longer the period in testing without showing signs of corrosion.

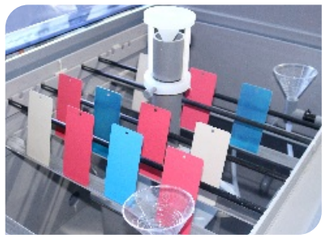
Salt spray testing is popular because it is cheap, quick, well standardized and reasonably repeatable. There is, however, only a weak correlation between the duration in salt spray test and the expected life of a coating (especially on hot dip galvanized steel where drying cycles are important for durability), since corrosion is a very complicated process and can be influenced by many external factors. Nevertheless, salt spray test is widely used in the industrial sector for the evaluation of corrosion resistance of finished surfaces or parts.

The apparatus for testing consists of a closed testing chamber, where a salted solution (mainly, a solution of 5%sodium chloride) is atomized by means of a nozzle. This produces a corrosive environment of dense saline fog in the chamber so that parts exposed in it are subjected to severely corrosive conditions.

Tests performed with a standardized 5% solution of NaCL are known as NSS (neutral salt spray). Results are represe-nted generally as testing hours in NSS without appearance of corrosion products (e.g. 720 h in NSS according to ISO 9227). Other solutions are acetic acid (ASS test) and acetic acid with copper chloride (CASS test), each one chosen for the evaluation of decorative coatings, such as electroplated copper-nickel-chromium, electroplated copper-nickel or anodized aluminium.

Some sources do not recommend to use ASS or CASS test cabinets interchangeably for NSS tests, as it is claimed that a thorough cleaning of the cabinet after ASS or CASS test is very difficult. ASTM does not address this issue, but ISO 9227 does not recommend it and if it is to be done, advocates a thorough cleaning.

Biuged offer various Salt Spray Cabinets from 150L capacity to customized cabinets according to different requirements. All of cainets not only can run NSS test but also CASS or ASS test



Scan for video



BGD 881

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 B117 *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 B380 *Standard Test Method for Corrosion Testing of Decorative Electrodeposited Coatings by the Corrodkote Procedure*

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

ASTM D1735 *Standard Practice for Testing Water Resistance of Coatings Using Water Fog Apparatus*

DIN 50021 *Salt Spray Testing*

Features

1.0 Structure Feature	
Chamber Structure	◆ Cabinets are made of imported 5mm PVC poly plate (Nanya, Taiwan) , max. durable temperature is 85 ℃ ◆ Cabinet sealing cover is made of European 6mm acrylic sheets ◆ Salt solution reservoir equipped with water level is designe in the chamber,easy to clean ◆ Humidifying tower is made of SUS 304#, endurable high pressure and good thermal insulation effect. ◆ Specimen supports designed specially ensure a adjustable position angle for each specimen in order to get a uniform fog and a big specimen in order to get a uniform fog and a big specimen capacity. ◆ Use water to seal working room, ensure the corrosion fog not to leak. ◆ Electric system is separated from water system, avoid water to enter electric control box to damage accessories ◆ There is a hole used to drain off fog at the back and bottom of chamber, its diameter is 48mm, just used other pipe to connect this hole to drain off the fog from the working room
Chamber Sealing Cover	V shape , the top angle is 100° , prevent condensate water during the test from dropping to specimen surface and affect testing results.
Atomizing Tower	In order to ensure the working room to get uniform fog while spraying, this chamber use a special structure glass nozzle to atomize salt solution absolutely, then fog enter a subuliform tower installed in the working room and spray to all working room uniformly. The installation height of atomizing tower can be adjusted to control spray fog amount precisely.
Fog Collector	Fog collectors are tapered funnels whose diameter are 100mm and installed in the working room.At the bottom of the funnel, there is a silicone pipe which connect with graduated cylinder installed outside. These graduated cylinders are used to monitor spray fog amount
Heating System	For working room, heating tube is made of titanium alloy, water vapour heat the working room under the control of P.I.D
Salt Solution Supply	The salt solution prepared well is stored in salt solution reservoir, and flow into supplying container under the water level difference. This supplying container is equipped with an automatic water leveling device which can control automatically the max. water level to keep a certain distance with spray nozzels.
Humidifying Tower	Is made of SUS304# stainless steel, and its temperature can be set from RT–63℃ and heating up time≤ 60 min, can add water automatically.Water level is monitored and system would alarm once exceed set level value.
Heater	Armoured titanium alloy electric heating tube (at the bottom of working room) Armoured SUS316# electirc heating tube (Humidifying tower) Heating controlling method：SSR
2.0 Fog Spray System	
Spray Fog Principle	Use Bernouilli's principle to absorb salt solution then atomize it Air Compressor→ Oil–water Separator (first) → Air Storage Tank→ Relief Valve→ Total Solenoid Valve→ Oil–water Separator (second) →Saturator→Pressure Regulating Valve→Solenoid Valve for spraying→Spray Nozzle
Spray Nozzle	Made of special glass, can control fog amount and spraying angle
Spray Pressure	Spray pressure can be adjusted from 0.07MPa to 0.17 MPa, in order to make sure the spray pressure generated from spray nozzle be within the range of standard requirements, it is divided into two steps, adjust air pressure to 0.2MPa to 0.3 MPa as the first step, then adjust to 0.07MPa to 0.17 MPa under the second step
Drain away Fog	Can drain away fog by manual or set a program to do it. Feed fresh compressed air to working room then drain away the fog of the working room quickly
3.0 Electronic Control System	
Controller	
Working Method	Worked at fixed value, starting and stopping is timed
Setting Method	English menu, input data by key
Display Resolution	0.1℃ (temperature)
Timer	Digital display , can set second, minute, 10 minutes, hour, 10 hours , max.is 9,999 hours, min.is 1 second
Programme Controller	Digital display , spray time and interval time can be set freely, infinite cycle. Timing unit: second, minute, 10 minutes, hour, 10 hours (switch freely) max.is 9,999 hours, min.is 1 second.
4.0 Safety Protection Device	
Cabinet	Over temperature protection, water leakage protection
Humidifying Tower	Over temperature protection, water leakage protection

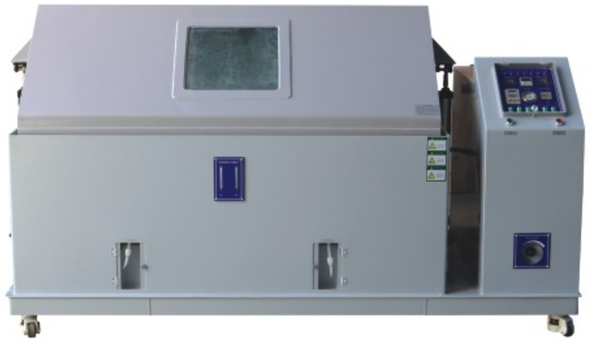
Heating System	Anti-dry safety protection: all heaters of the cabinet are fitted with a temperature limit protection, which can effectively solve the problem of overheating , heating tube dried , abnormal water supply, short circuit and overload etc.
Water Supply	Water level protector for working room, low water level protector for humidifying tower
Power	Earth leakage protection, overload and short-circuit protection

Main Technical Parameters：

★ Working Room Temperature Range: Rt ~ 50℃
★ Humidifying Tower Temperature Range: Rt ~ 63℃
★ Temperature Uniformity: ≤ ± 2℃ （No-load）
★ Temperature Stablility: ≤ ± 1℃ （No-load）
★ Temperature Devitation of Working Room: ± 1.0℃
★ Temperature Increasing Rate: Rt→55℃ less than 60 minutes（working room）;
Rt→63℃ less than 60 minutes（saturated barrel）
★ Compressed Air Supply: Customer should prepare a air compressor which can offer clean, waterless and oilless compressed air, 0.4MPa ~ 0.8MPa pressure



CR-4 Steel Panels


BGD 883



Ordering Information → Technical Parameters ↓	BGD 880	BGD 881	BGD 882	BGD 883
Working Room Size（W×H×D), mm	600×400×450	900×500×600	1200×500×800	1600×500×1000
Working Room Capacity （no including V shape cover）	108 L	270 L	480 L	800 L
V Shape Cover Volume	Appr. 50 L	Appr. 140 L	Appr. 250 L	Appr. 380 L
Overall Size（W×H×D), mm	1150×1090×672	1550×1240×900	1980×1350×1100	2480×1450×1250
Qua. of V Shape sample holder/pole	4/6	6/12	8/16	10/22
Tank capacity for Salt Solution	15	25	40	45
Collectors	1	2	2	2
Max. Sample Capacity（15cm×7cm）	28pcs	70pcs	108pcs	120pcs
Method of Opening Cover	Manual	Manual	Pneumatic	Pneumatic
Total Power	2.2 kW	2.2 kW	3.8 kW	3.8 kW
Salt Solution Consumption	15 L/d	15 L/d	25 L/d	25 L/d
Water for heating Consumption	30 L/d	30 L/d	40 L/d	40 L/d
Compressed Air Consumption	1m³/h	1m³/h	2m³/h	2m³/h
Power Supply	220V；50/60HZ			

Optional Accessories：BGD 1356---Glass Spray Nozzle
BGD 2309---CR-4 Steel Panels for Calibration of Salt Spray（Conforms ISO 3574, 20 pcs for one package）
（See page 165）

Cathodic Disbonding Test Chamber

The Cathodic Disbonding Test Chamber is designed to evaluate the cathodic disbonding resistance of coatings (typically used to protect metal substrates in marine vessels and offshore structures) exposed to seawater. It accurately assesses coating adhesion failure caused by cathodic protection, which often initiates at defects in the coating system, such as unintentional coating loss, application flaws, or excessive permeability.

Artificial holidays (intentional defects) are created on coated specimens, which are then immersed in the test solution (artificial seawater) inside the chamber. Two specimens are connected to either a cathodic protection circuit (Method A) or a sacrificial anode (Method B), while two additional specimens remain unconnected as control samples. After testing, the specimens are immediately inspected for blistering and underfilm corrosion around the artificial holidays. The degree of blistering and disbondment is evaluated according to relevant standards (e.g., ISO 15711). By comparing protected and unprotected specimens, the coating's performance under cathodic protection conditions is assessed.

The BGD 872 Cathodic Disbonding Test Chamber consists of: Electrical control system (Siemens PLC), Heating system, Aeration device, Water circulation system. Its inner tank is made of high-temperature-resistant PP board, while the outer shell is constructed from metal sheet with painted finish. A transparent acrylic cover allows easy observation of specimens. The chamber complies with ISO 15711 (Paints and varnishes Determination of resistance to cathodic disbonding of coatings exposed to seawater).

Features:

- Dual Testing Modes: Supports both Method A (impressed current/ cathodic protection) and Method B (sacrificial anode).
- Real-Time Voltage Monitoring: Displays voltage differentials and voltage-time curves on the touchscreen. The system automatically alerts when coating failure occurs.
- Temperature Tracking: Real-time display of solution temperature and temperature-time curves.
- Data Export: Test data can be saved to a USB drive in Excel format.
- Fault Alarm: A red flashing indicator (on the right side of the device) signals operational faults.

Main Technical Parameters：

★ Working-room Size（L×W×H）: 73cm×65cm×73cm（1m³）
★ Adjustable Solution Temp. Range of Working-room: 20℃ ~ 80℃
★ Temp. Resolution: 0.1℃
★ Temp. Uniformity: ≤1.5℃
★ Temp. Fluctuation: ±0.5℃
★ Temp. Control Accuracy: ±0.1℃
★ Thermal Balancing Method: Electric heating with PID + SCR regulation control
★ Aeration Device: Microporous bubble aeration via PP tube
★ Power Supply: AC 220V/50Hz, Max. Current: ~10A;
Max. Load Capacity: 3kW
★ Dimension（L×W×H）: 127cm×100cm×120cm
★ tandard Electrodes Included: Anode electrode (graphite) & reference electrode
★ **Ordering Information:**
BGD 872---Cathodic Disbonding Test Chamber



Coatings Rust & Corrosion Grading Image Analyzer

After accelerated aging or natural exposure in corrosive environments, coatings often develop various forms of deterioration, collectively referred to as "defects." These defects can be categorized primarily into blistering, rusting, cracking, flaking, etc. According to ISO 4628-3 *Paints and VarnishesEvaluation of degradation of coatingsDesignation of quantity and size of defects, and of intensity of uniform changes in appearancePart 3: Assessment of degree of rusting,* the severity of corrosion is assessed based on two key factors: **Quantity of defects** (percentage of affected area); **Size of defects** (dimensions). Currently, defect evaluation is primarily conducted through visual inspection by experienced technicians. However, this method presents significant challenges due to subjectivity and operational difficulties:

• Technicians often struggle to quickly and accurately quantify defects (count, size, density, area).

• Inconsistencies arise between different inspectors due to varying judgment criteria.

The **BGD 355/1 Coating Rust & Corrosion Grading Image Analyzer**, developed by **Biuged**, resolves these issues effectively. This intelligent instrument automates rust/corrosion area detection through AI-powered image recognition, supporting both fully automatic and interactive user-guided modes. Its core components include a high-resolution camera, a LED illumination system and a motorized sample tray.

Samples (up to 150mm× 70mm) are placed on the tray for ultra-HD imaging, then analyzed via deep learning-based computer vision algorithms. The system not only precisely measures rusted areas but also automatically grades results per relevant standards, significantly improving repeatability and comparability of corrosion evaluations.

Features:

- Complies with ISO 4628-3, ASTM D610
- Rapid large-area scanning detects rust defects within seconds, enhancing efficiency.
- AI image processing reduces human error and manual workload.
- Automated data storage enables traceable quality analysis and process optimization.
- Flexible modes: Full-auto recognition or interactive manual selection for varied scenarios.

Main Technical Parameters：
★ Max Sample Area: 150mm× 70mm
★ Camera Resolution: 15 μm
★ Measurement Time: <30s per scan
★ Tray Speed: 40mm/s
★ Light Source: White LED
★ Language: English/Chinese
★ Operating Conditions: 5℃–40℃; ≤80% RH (non–condensing at 35℃)
★ Interfaces: 2×USB 3.0 (500mA)
★ Minimum System Requirements: Windows 10/11 (64–bit), 12th Gen Intel i5 (or equivalent), 8GB RAM, NVIDIA GPU (≥8GB VRAM)
★ Power Consumption: 150W
★ Dimensions (L×W×H): 450mm× 350mm× 350mm
★ Weight: 20 kg
★ **Order Information:**
BGD 355/1–––Coating Rust & Corrosion Grading Image Analyzer



ISO Scratching Tool

BGD 1285 ISO Scratching Tool is a simple but effective instrument which is used to scratch the surface of samples in preparation for adhesion, salt spray and corrosion tests. The tool is held horizontally and pulled across the sample to produce the scratch.

It is be used in according with ISO 17872：2007, ISO 2063, ISO 7253, BS 7479. There are two “V” shape cutters at one end , and two “U” shape cutters at the other end. All cutters are made of special tungsten steel and can be replaced easily. Having this scratch tool, operator can do “V” or “U” shape scratch easily and quickly.





U shape cutter　　V shape cutter

★ **Ordering Information:** BGD 1285–––ISO Scratching Tool
BGD 1285/J–001–––V shape cutter
BGD 1285/J–002–––U shape cutter

Electric Scribe Marks Machine for Corrosion Testing

In the corrosion testing of different coatings, we always need to prepare a specific scribe marks on the coating surface. Manual cutting often lead to defects, such as non-straightness scribe marks, damaged edges of the scribe marks, inconsistent damage to the substrate. These defects may have a random influence on the test results. Moreover, when we cut the scribe marks on the multilayer coating, manual operation becomes more difficult, it cost more time and difficult to obtain a uniform scribe mark.

For the corrosion resistant coating, its neutral salt spray testing demands a vertical 2mm scribe mark. BGD 539 Automatic Scribe Marks Machine for Corrosion Testing can make this scribe mark easily, moreover, it has the following characteristics:

- 1mm & 2mm wide vertical scratch, strictly comply with the standard.
- The cutting blade adopt rotary cutting principle to ensure the edge of the prepared scratch is neat and without damage.
- The cutting blade is floating design, can load different thickness test panel, and can minimize the damage of the substrate
- With scale indication, easy to cut different size scratch.

Main Technical Parameters：
★ Working Distance: 0~150mm
★ Scribe mark Depth: 0~2000 μm
★ Test panel Thickness: 0~10mm（include the thickness of the coating）
★ Working Platform Size: 340mm×170mm
★ Overall Size: 375mm×300mm×455mm
★ Net Weight: 7.5 kg
★ Ordering information:
BGD 539––– Electric Scribe Marks Machine for Corrosion Testing

Note: Biuged can customize this machine for special scribe mark, including different working platform size, different working distance.



CR-4 Steel Panels for Calibration of Salt Spray

For a salt spray test, the corrosivity speed of test specimen not only depend on the apparatus itself, such as salt fog uniformity, working-room temperature uniformity, but also depend on all kinds of paramters set by operator, such as volume of the collected solution, pH value of salt spray etc. In order to ensure the comparability of salt spray tests, operator should use reference speciments to verify these influecing factors regularly.

Both ISO 9227 and ISO 7253 recommend use CR4-grade steel as reference specimens. These specimens are in accordance with ISO 3574 with an essentially faultless surface and a matt finish (arithmetical mean deviation of the profile R_a=0.8 m±0.3 m) . For the three salt spray tests, the allowed range of mass loss of the steel reference speciments during verification of the corrosivity of the cabinet are as below:

A. Netural Salt Spray (NSS) : After 48h test, the allowed range of mass loss should be 70g/m²±20g/m²

B. Acetic acid Salt Spray (AASS) : After 24h test, the allowed range of mass loss should be 40g/m²±10g/m²

C. Copper-accelerated Acetic acid Salt Spray (CASS) : After 24h test, the allowed range of mass loss should be 55g/m²±15g/m²

For ISO 7253 *Paints and varnishes -- Determination of resistance to neutral salt spray (fog)* , use six CR4-grade sepciments, after 96 hours exposure, the allowed range of mass loss should be 130g/m²±20g/m² and no individual panel has a mass loss greater or less than 25g/m² from the mean or from a value agreed by the interested parties.

BGD 2309 CR-4 Steel Panels for Calibration of Salt Spray are according with ISO 3574: Carbon content ≤ 0.06%、manganese content ≤0.45%、phosphorus content ≤0.03%、sulfur content ≤0.03%, Surface roughness Ra is 0.8 m± 0.3 m, and size is 150mm×70mm×1.0mm

Ordering Information:

BGD 2309—CR-4 Steel Panels for Calibration of Salt Spray (20 pcs/package)



Accelerated Aging Test Chambers

Many polymer materials are often be damage by natural environmental factors which from Earth's surface and atmosphere when used outdoor. This affects their useful life. In order to properly assess their useful life in the outdoors, using the environmental testing equipment to simulation of each kinds of natural climatic conditions , study weather resistance of each kinds of products in the laboratory has become a widely and effective method.

For accelerated aging test, two most universal light sources in the world are Fluorescent UV lamp and Xenon lamp. Fluorescent UV lamp just simulates the UV part of full sunshine, so it's too difficult to get the consistent testing result between exposed sample and practical use sample. But xenon lamp can simulate the spectrum distribution of full spectrum sunshine. So, using the xenon lamps as light source to evaluate the fact lifetime of high polymer materials has higher feasibility.

As the earliest company in China who works on researching and developing accelerated aging test chambers, Biuged has rich experience and unique advantage in research and manufacture these aging chambers. Most of our aging testers are equipped with the same light source as American similar products, thus ensure the test results have the comparability and repeatability. Moreover, considering the experimenters operation habits, we developed our own intellectual property rights controlling system. At the same time, Biuged has a lot of seasoned engineers who can offer strong and timely technical supporting.

According to different fields and different laboratories' requirements, Biuged developed more than ten different types aging chambers which cover from UV light accelerated aging testers to Xenon light accelerated aging testers, from bench type to console mode and cabinet type, from flatbed samples holder to rotating samples holder. For any experimenter, he always can find a suitable aging tester for his own application.

Now, there are more than one thousand Biuged's aging test chambers who are working everyday in all over the world. High efficiency and stable working status, affordable price , precise and accurate test results and professional technical supporting make Biuged products become preferred aging testers in many fields.

UV Light Accelerated Aging Test Chambers

Test Principle

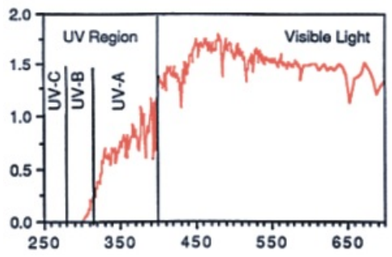
The ultraviolet rays of sunlight are the main factor who damage weathering resistance of most materials. We use UV lamps to simulate the short wave part of sunlight, it produce few visible lights and infrared lights. According to different testing requirements, we choose different wavelength UV lamps, 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:

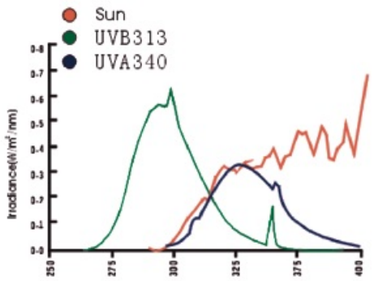
① **UVA-340 Lamp:** UVA-340 Lamp can highly simulate short-wave ultraviolet light of sunlight, the wavelength range is from 365 nm to 295 nm.

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.



Distribution of Sun Spectrum



The Spectrum comparison of UV and Sun

UV Light Accelerated Aging Chamber

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.

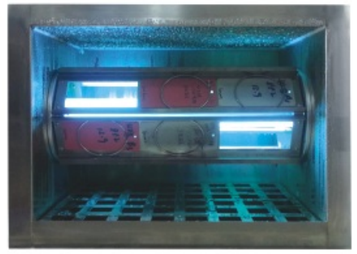
This chamber can isolate 18 pcs standard panels (Size is 150mm×70mm). Samples are installed a column form rotating sample rack. During the test, the sample rack rotate uniformly and ensure every sample get the same irradiance energy, increase the comparability and repeatability of testing results.

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/m^2 (New UVA lamp)
- Full stainless steel inner working room with sandwich design, never getting rusty and leakage. Also prevent water vapor 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.



Main Technical Parameters：
★ Total power: 1.2 kW
★ Settable temperature range of working room: RT+5℃ ~ 60℃
★ Settable range of test time: 1h ~ 99,999h
★ Settable range of spray time: 1min–99,999min
★ Settable range of spray interval time: 1min–99,999min
★ Rated life of lamp: 1,000h
★ Wave length of lamps: 313 nm （UVB Lamps） or 340 nm （UVA Lamps）
★ Lamp power: 3 pcs; each lamp is 20 W
★ Water cosumption for spray: 3L/min
★ Capacity for test panels: 18 pcs standard size panels
★ Specification of sample: 150mm × 70mm
★ Cabinet Size: 940mm × 490mm × 630mm（L × D × H）
★ Net Weight: 72 kg
★ Power Supply: 220V/50Hz，6A
★ **Ordering Information:**
BGD 852---Bench UV Light Accelerated Aging Chamber
BGD 852/W-009---UVA lamps (20W/340nm)
BGD 852/W-010---UVB lamps (20W/313nm)


Working Room



Operation Menu

UV Light Accelerated Weathering Tester

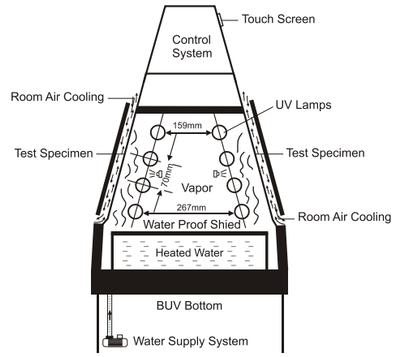
BGD 855 & 856 UV Light Accelerated Weathering Tester (hereinafter referred as BUV) adopts fluorescent UV lamp as the light source. Its inner temperature and humidity can be properly controlled to obtain the periodic condensation on the sample for fully evaluating the damaged factor caused by sunlight, moisture and temperature (materials aging phenomenon includes fading, gloss loss, 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 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 D4587** *Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings*
- **ASTM D4329** *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 D0205** *Test Method of Weather-ability for Automotive Parts*





BUV Test principle

Main Technical Parameters：
★ Light Source: UV–A (wave length 340 nm) or UV–B (wave length 313 nm) ; 40W × 8 pcs (The normal use–life is 6,000 hours)
★ The range of Irradiance: 0.3 W/m^2 ~ 1.55 W/m^2
★ Temperature Range: Black Panel Temperature（BPT）: RT+10℃ ~ 80℃
★ Interior of cabinet: Stainless steel –SUS 304 material
★ Exterior of cabinet: Powder coating on SUS 304
★ Insolating Area: 5,175cm^2/828in^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: 161 kg Total Max. Power: 2kW
★ Power: 220V/50HZ（60 HZ is custom）, 10A （Max Electric Current）

Feature

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

All BUV machines use fluorescent UV lamps produced by Amercia or Germany 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 America or Germany 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 or Germany



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）**

Like all fluorescent lamps, BUV UV lamps experience gradual energy decay over time. The BUV control system compensates for this reduction by progressively increasing lamp power output. However, as lamp usage accumulates, the energy output continues to diminish. When operating at relatively high setpoints, the BUV system may eventually become unable to maintain target irradiance levels, triggering a "High Irradiance Error" fault and automatic shutdown. At this stage, user intervention with the BUV Irradiance Calibrator becomes necessary.

The BUV system utilizes our proprietary irradiance calibration technology; notably, a single calibrator can service multiple BUV units. This specialized device measures fluorescent UV lamps with dual functionality - capable of calibrating both UVA-340 and UVB-313 lamp types.

Calibration System Components (as illustrated)consists of an iIrradiance meter (display/control unit) and an irradiance sensor (measurement probe). A typical calibration procedure as below:

① During normal BUV operation, insert the calibration probe into the designated calibration port

② Press the corresponding channel button on the calibrator interface.

③ The system automatically completes calibration without requiring manual calculations.



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 exposuring 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.

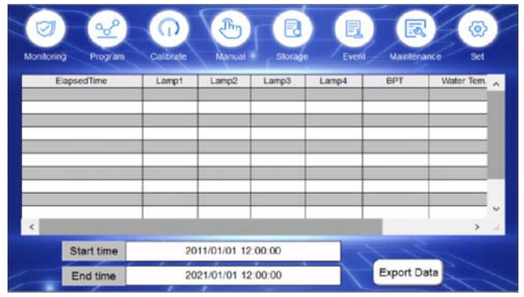
BUV can permit operator to edit six test programs at most and save it permanently. Generally speaking, if the operator has set and saved one program in the BUV, for next test, if he still use this same program, just choose this program and run BUV directly, no need to set again.

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

BUV all controlling 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 Data Export 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 Export 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 856---UV Light Accelerated Weathering Tester（Standard）
BGD 856/W-007---UVA-340 Lamps（40W/340nm）
BGD 856/W-068---UVA-351 Lamps（40W/351nm）
BGD 856/W-070---UVA-340+ Lamps（40W/340nm, suitable for higher irradiance）
BGD 856/W-071---UVB-313EL+ Lamps（40W/313nm, suitable for higher irradiance）
BGD 856/W-077---UVB-313 Lamps（40W/313nm）
BGD 8118---Multifunctional Irradiance Radiometer（UVA&UVB）
BGD 145---Multifunctional Irradiance Radiometer Body
BGD 8139----Calibration Probe for UVA&UVB lamps
（BGD 8118 = BGD 145 + BGD 8139）



BGD 8118

All UV Lamps and its relevant settable range of irradiance W/m²

Lamps Type→	UVA-340	UVA-340+	UVA-351	UVB-313EL	UVB-313EL+	Expected lifetime of lamps
Range of low irradiance	0.40 ~ 0.59	0.60 ~ 0.74	0.35 ~ 0.59	0.40 ~ 0.47	0.40 ~ 0.47	Approx. 1000h
Range of high irradiance	0.91 ~ 1.25	0.96 ~ 1.85	0.81 ~ 1.25	0.63 ~ 0.95	0.96 ~ 1.85	Approx. 1000h
Best Range of irradiance	0.60 ~ 0.90	0.75 ~ 0.95	0.60 ~ 0.80	0.48 ~ -0.62	0.48 ~ 0.95	Approx. 6000h

Note: Manufacturer's warranty and liability provisions do not cover irradiance settings exceeding the maximum rated capacity of the lamp.

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 which 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, gloss loss, intensity reduction, cracking, flaking, chalking, and oxidation).

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



Simulated Sun with full spectrum



Simulated Rainfall

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*

All B-SUN Types

Ordering Information→ Parameters ↓	BGD 864 Bench Xenon Chamber	BGD 864/S Bench Xenon Chamber	BGD 860 New Xenon Chamber	BGD 867 Cabinet Xenon Chamber	BGD 862&862 Plus Large Xenon Chamber
Xenon Lamps	1 piece 1.8KW air-cooled American xenon lamp		1 pc 1.8KW air-cooled American xenon lamps	3 pcs 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	Daylight Filters
Sample holder	Flatbed	Flatbed	Rotating drum	Flatbed	Rotating drum
Samples Capacity (150×70mm)	9 pieces	9 pieces	23 pieces	25 pieces	65 pieces
Edit Program	10 programs	10 programs	10 programs	10 programs	10/＞999 programs
Spray Function	No	Yes（front）	Yes（front & back）	Yes（front）	Yes（front & back）
Dark Function	No	Yes	Yes	Yes	Yes
Control BPT.	Yes	Yes	Yes	Yes	Yes
BPT. Range	RT~90℃	RT~90℃	RT~100℃	RT~100℃	RT~110℃
Working room Tem. Range	——	——	RT~65℃	RT~65℃	RT~70℃
Control Irradiance	Yes	Yes	Yes	Yes	Yes
Irradiance Range (340nm)	0.3W/m² ~ 0.8W/m²（Americian lamp）		0.3W/m² ~ 0.75W/m²		0.25W/m² ~ 1.26W/m²
Monitoring method to irradiance	4	4	4	4	4
Monitor cumulative Energy	No	Yes	Yes	Yes	Yes
Control work room relative humidity	No	Only show	Yes	Yes	Yes
Export test data	Yes	Yes	Yes	Yes	Yes
Alarm Function	Yes	Yes	Yes	Yes	Yes
Calibration Function	Yes	Yes	Yes	Yes	Yes
Pure water machine	No	Optional	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 G155-05, 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.

① Bench Xenon Test Chamber

BGD 864 is a small, simple and economic xenon test chamber. It uses a low power air-cooling xenon lamp to produce enough high irradiance energy in a small space. Moreover, through a special catoptrical system to ensure every exposure sample get the homogeneous irradiance distribution.

BGD 864 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**".

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.

Furthermore, this bench xenon chamber can be equipped with various optional functional modules to perform working conditions such as water spray, humidity control and water immersion while light irradiation is applied.

Characters

◆ Cost-effective performance: Featuring competitive purchase price, low-cost lamps and low operating expenses, this weathering chamber delivers outstanding cost-performance. Even small laboratories can now afford to conduct xenon-arc weathering tests.

◆ 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.

◆ Compatible with both domestic and imported xenon lamps. The lamp service life reaches approximately 1,500 hours, and lamp replacement is simple.

◆ Fast test results: When products are exposed outdoors, they are only subjected to maximum-intensity direct sunlight for a few hours per day. This test chamber, however, exposes test specimens to irradiance equivalent to mid-summer noon sunlight 24 hours a day continuously, enabling rapid ageing of samples.

◆ 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 blackboard temperature by themselves.

◆ With High precision Pt100 Temperature sensor. Blackboard 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.

◆ 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.

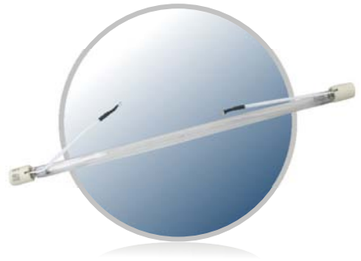
◆ A dedicated auxiliary cooling air system is available as an option. It can lower the chamber temperature down to 20℃ minimum, suitable for xenon-arc testing of specimens under ambient or low-temperature conditions.



BGD 864



BGD 864/SH



1.8KW xenon lamp



Sufficient exposure space



Flip–top design facilitates lamp installation, maintenance and inspection

Main Technical Parameters：
★ Xenon Lamp: One 1.8KW xenon lamp（From USA or China）
★ 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 cm^2 （can put 9 standard samples 150×70mm）
★ Adjustable Irradiance Range：30W/m^2 ～100 W/m^2 （300~400nm） or 0.3W/m^2 ~0.8 W/m^2 （@340nm） or 0.5W/m^2 ～1.5 W/m^2 （@420nm）
★ Adjustable Black Panel Temperature Range：RT~90℃ （Depends on environment temperature and setting irradiance value）
★ Interior Material of Chamber：Stainless steel –SUS 304 material
★ Exterior Material of Chamber：Powder coating
★ Power Supply: 220V 50/60HZ（Alternative）



Operation Menu







Ordering Information → Technical Parameters ↓	BGD 864 Bench Xenon Test Chamber	BGD 864/S Bench Xenon Test Chamber（Spray）	BGD 864/SH Bench Xenon Test Chamber（Spray&Humidity）	BGD 864/WI Immersion Bench Xenon Test Chamber
Exposure Cycle	Light, Darke	Light, Spray, Darke	Light(Controllable Humi.),Spray, Dark	Light+Immersion, Darke
Working Room Humi.	–––	Show only	Controllable from 40%–60%	–––
Total Maximum Power	2.5 kW	2.7 kW	5.5 kW	4.5 kW
Total Maximum Current	12 A	15 A	25 A	21 A
Overall Size（W×D×H）	93cm×65cm×57cm	93cm×65cm×80cm		
Net Weight	65 kg	100 kg		
Optional Accessories	BGD 866/W–026–––Air–cooled Xenon Lamps from USA（1.8 KW） BGD 866/Z–010–––Air–cooled Xenon Lamps from China（1.8 KW） BGD 8170–––Pure Water Machine（50L/h） Xenon Calibration Radiometer			

② Xenon Test Chamber（New）

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.

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.
- ◆ Optional dedicated xenon-arc aging chamber auxiliary cooling system can lower the chamber temperature to a minimum of 20℃, suitable for xenon-arc testing of samples at room temperature or lower temperatures.



With spray function



Rotating-drum design of sample holder



Various optical filters

Main 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 cm^2 （can put 23 pcs samples of 150mm × 70mm size）
- ★ Adjustable Irradiance Range：
  0.3 ~ 0.75 W/m^2 （Single point of control：340nm）
  0.5 ~ 1.35 W/m^2 （Single point of control：420nm）
  30 W/m^2 ~ 90 W/m^2 （Full spectrum：from 300nm ~ 400nm）
  310 W/m^2 ~ 780 W/m^2 （Full spectrum：from 300nm ~ 800nm）
- ★ Controlling irradiance point：340nm or 420nm or 300nm ~ 400nm or 300nm ~ 800nm
- ★ Adjustable BPT and BST 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：200 kg
- ★ 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 860/Z-010---1.8 KW Air-cooled Xenon Lamp from USA
  BGD 860/Z-012---1.8 KW Air-cooled Xenon Lamp from China
  BGD 8170---Pure Water Machine（50L/h）
  BGD 8178---Auxiliary Cooling System
  BGD 8179---Air Compression System（Includes air compressor、air reservoir, freezing dryer, precise filter etc.）
  （See page 185 for Xenon Calibration Radiometer）

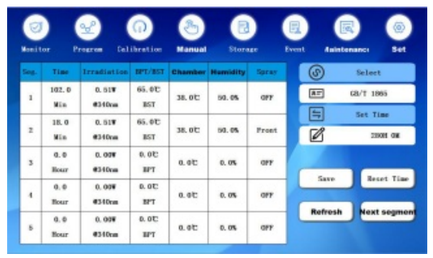




All test parameters can be set



Data can be saved in real time



Precise control of irradiance, temperature, humidity



Alarm protection function

③ Cabinet Xenon Test Chamber

This is a powerful xenon arc aging test chamber ideally suited for 3D sample testing. It features three genuine U.S.-imported xenon lamps with daylight filters, fully meeting various international testing standards.

The BGD 867 Cabinet Xenon Test chamber can accommodate 25 standard test panels, equipped with both spray function and relative humidity control inside the working chamber.

Operators can freely set all required test parameters (irradiance energy, exposure time, black panel temperature, spray duration, relative humidity of working-room, etc.) through the human-machine interface, while monitoring the machine's operating status in real time. All operational parameters during testing can be directly downloaded to a computer via USB interface.

Characters

- Three xenon lamps imported from America can offer higher irradiance energy, meet with all test standards' requirements.
- Can set and control automatically the relative humidity of working room.
- 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.
- Can set the cumulative energy (total irradiance energy) obtained by sample to finish a test procedure.
- With front spray function, can set spray time and spray interval time.
- 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 or BST, big irradiance difference, auto shut-down protection when opening door, spraying water shortage, big error of humidity, large deviation ofworking room temperature, air pressure protection of lamp cooling air.
- 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 allows users to copy the test data into a USB drive, achieving unattended operation.





Operation Menu



Flat tray is suitable for 3D or special-shape samples

Main Technical Parameters:	
★ Xenon Lamp:	Three 1.8 kW xenon lamps (imported from America)
★ Filter:	Daylight filter (Also can choose extended UV filter or window glass filter)
★ Lamp Lifetime:	Near 1,500 hours
★ Exposure Area:	2,800 cm^2 (can put 25 pcs samples of 150mm × 70mm size)
★ Adjustable Irradiance Range:	0.3 ~ 0.75 W/m^2 (@340nm)
	0.5 ~ 1.35 W/m^2 (@420nm)
	30 W/m^2 ~ 90 W/m^2 (@300nm ~ 400nm)
	310 W/m^2 ~ 780 W/m^2 (@300nm ~ 800nm)
★ Controlling irradiance point:	340nm or 420nm or 300nm ~ 400nm or 300nm ~ 800nm
★ Adjustable BPT and BST Range:	RT ~ 100℃
★ Adjustable relative humidity of working room:	10% ~ 75% (Light); 10% ~ 95% (Dark)
★ Interior Material of Chamber:	Aluminum profiles
★ Exterior Material of Chamber:	Powder coating
★ Overall Size:	950mm × 1200mm × 2000mm
★ Net Weight:	385 kg
★ Power Supply:	Three-phase AC 380V 50 or 60HZ; Max. Current 32A Rated Power: 7.5kW
★ 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 867---Cabinet Xenon Test Chamber
BGD 866/W-026---Air-cooled Xenon Lamps from USA (1.8 KW)
BGD 866/Z-010--- Air-cooled Xenon Lamps from China (1.8 KW)
BGD 8170---Pure Water Machine (50L/h)
BGD 867/W-080---Daylight Filter
BGD 867/W-010---Window Glass Filter
BGD 867/W-082---Extended UV Filter
(See page 185 for Xenon Calibration Radiometer)

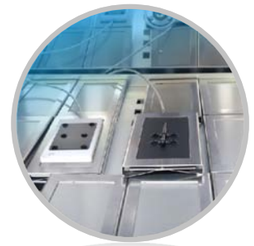


can put 25 pcs samples of 150mm × 70mm size

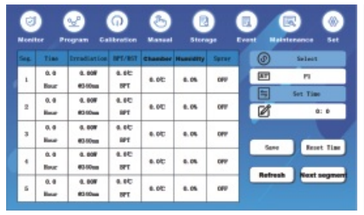


With front spray function, can set spray time and spray interval time





Black panel temperature is accurate and stable.



The test procedures can be programmed freely



Data can be saved in real time



Alarm protection function

④ Large Xenon Test Chamber

BGD 862 or BGD 862 Plus are multi-function large xenon light accelerated weathering testers which is equipped with one piece high power (6.5KW) water-cooling xenon lamp, its exposure area arrive 6,500cm^2

Powerful functions and reliable test results

◆ Meet with all international standards of xenon test.

◆ Equipped with ATLAS xenon arc lamp, filter and components, ensure to get high and same running parameters. Test results have a good reliability and repeatability comparing with import machines.

◆ Automatic rotating drum-type sample rack with three floors structure maximizes exposure uniformity over all specimens

◆ 6,500cm 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

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.

◆ Can set spray way to sample (front spray or back spray) , spray time and spray interval time.

Simple, easy to use

◆ Industrial control touch screen (For BGD 862) or industrial control all-in-one computer touch screen (For BGD 862 Plus), menu operation control

◆ Users can also customize test programs according to their needs and save them.

The BGD 862 Plus supports up to 9,999 editable programs, with each program allowing 30 different working condition segments (including sub-cycles). With massive storage for user programs, operation becomes flexible and convenient.

The BGD 862 allows 10 editable programs, each with 10 segments (sub-cycles not supported).

◆ 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.

◆ Come with constant pressure pump which offer constant water pressure to chamber, also ensure a stable spray amount.

◆Pure (deionized) water machine is optional. With high purity water, operator can get a more reliable testing result, Chamber has alarm function for monitoring water.

Safe and reliable

◆Many alarm protections: Big irradiance difference, pure water conductivity is over limits, too high temperature of cooling water, too low flow rate of cooling water, over-temperature, heating problem, abnormal lamp power, 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.

Unique Features of the BGD 862 Plus Upgraded Version

◆Each specimen rack is equipped with an independent timing function, enabling operators to quickly identify panels subjected to different exposure durations.

◆ Latest resonant circuit technology for faster and more reliable lamp ignition;

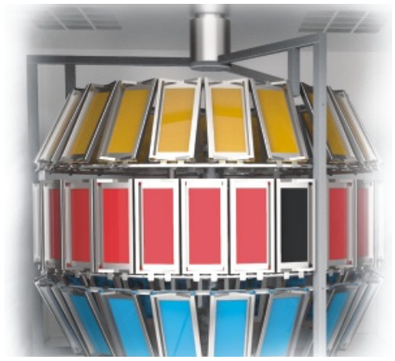
◆ Real-time monitoring of cooling water flow for the lamp, ensuring stable and reliable cooling;

◆ The lamp control circuit now includes both voltage and current loops in addition to the original closed-loop irradiance control system, delivering more stable irradiance regulation.





Operation Menu



Working room





Irradiance Calibration Windows



Operation Menu

Ordering Information → Technical Item ↓	BGD 862 and BGD 862 Plus Xenon Test Chamber
Xenon Lamp	6.5 kW water cooling long arc xenon lamp
Light Filter	Import originally from ATLAS, can simulate indoor or outdoor sunshine spectrum
Exposure Area	BGD 862→6,500 cm^2 (67–69 pcs standard samples of 15cm × 7cm size) BGD 862Plus→7,300 cm^2 (76–78 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 center)
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)
Deionized Water Consumption (24h)	300L ~ 400L (When running ISO 16474–2 Cycle No.1)
Power Supply	AC380V ± 10%，Three–phase four–wire 50Hz；Max. Current 50A，Max. Power 9.5KW
Overall Size (L × W × H)	BGD 862→1,220mm × 1,200mm × 1,970mm　BGD 862 Plus→1,170mm × 1,370mm × 1,970mm
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 center 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 two inner filters and one 4.5K/6.5K outer filter（S BORO/S BORO）
Control System	1set	SIEMENS	PLC+ Siemens analog input
Interface	1pc	Industrial control integrated computer	15" human–computer touch screen

Table B：Adjustable Range of Irradiance

Combination Filters			Adjustable Range of Irradiance（W/m²）			
Filters	Inner Filter	Outer Filter	340nm	420nm	300–400nm	300–800nm
Daylight	Type S Boro	Type S Boro	0.25～1.26	0.59～2.76	29～141	261～1318
Window Glass	Type S Boro	Soda Lime	0.23～1.10	0.61～2.76	28～129	283～1352
Extended UV	Quartz	Type S Boro	0.29～1.50	0.59～2.79	32～161	276～1425

Optional Accessories

BGD 862/W-001---ATLAS 6.5 kW Xenon Lamp（Water-cooled）

BGD 862/Z-019---USA brand 6.5 kW Xenon Lamp（Water-cooled）

BGD 862/Z-016---BGD 2,000 HRS Supply PKG（Includes one USA brand 6.5 kW water-cooled xenon lamp, 5pcs W-143 inner filters, 1 pc W-144 outer filter）

BGD 862/Z-017--- ATLAS 2,000 HRS Supply PKG（Includes one ATLAS 6.5 kW water-cooled xenon lamp, 2 pcs S65 inner filters,one pc 4.5K/6.5K outer filter）

BGD 8171---Purity Water Machine（100L/h, 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 8178---Auxiliary Cooling System

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

BGD 862/Z-010---Daylight Filter

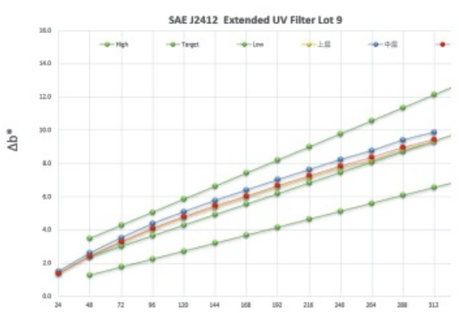
BGD 862/W-125---Metal Frame Air Filters

BGD 862/Z-018---Sample shelf

（See page 185 for Xenon Calibration Radiometer）

Validation data of standard PS board

BGD 862 & An imported aging chamber of the same model



BGD 862 Xenon Test Chamber meets the requirements.



BGD 8176



BGD 8171

⑤ Multifunctional Irradiance Radiometer

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.

Main 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%/℃

★ Operating Environment: 0 ~ 50℃； 10%RH～90%RH

★ Maximum Working Temperature: 70℃

★ Main Body Size: 143mm×75mm×20mm

★ Net Weight (main body and probe): 380g

★ **Ordering Information:**

BGD 8118--Multifunctional Ultraviolet Irradiance Radiometer (UVA&UVB)

BGD 8140--Multifunctional Xenon Lamp Irradiance Radiometer (340nm)

BGD 8141--Multifunctional Xenon Lamp Irradiance Radiometer (420nm)

BGD 8142--Multifunctional Xenon Lamp Irradiance Radiometer (300nm~400nm)

BGD 8143--Multifunctional Xenon Lamp Irradiance Radiometer (300nm~800nm)

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







Other Instruments

Surface Roughness Tester

Surface Roughness Tester is widely used in production site to measure surface roughness of various machinery-processed parts, calculate corresponding and clearly display all measurement parameters.

Specifications		Ordering Information	
		BGD 930	BGD 931
Standard		ISO4287,DIN4768,JIS B,ANSI 146.1	
Measuring range	Ra	0.005 ~ 16μm/1.000 ~ 629.9μinch	0.050 ~ 10μm/1.000 ~ 400.0μinch
	Rq	0.005 ~ 16μm/1.000 ~ 629.9μinch	-----
	Rz	0.020 ~ 160μm/0.780 ~ 6299μinch	0.020 ~ 100μm/0.780 ~ 400.0μinch
	Rt	0.020 ~ 160μm/0.780 ~6299μinch	-----
Accuracy		⩽ ± 10%	
Resolution		0.001μm (reading < 10μm)	
		0.01μm (10μm⩽reading < 100μm)	
		0.1μm (reading ⩾100μm)	
Fluctuation of display value		⩽6%	
Profile digital filter	Filtered profile	RC,PC-RC,GAUSS	-----
	Non- filtered profile	D-P	-----
Sensor	Radius	5μm	10μm
	Material	Diamond	Diamond
	Measuring force	4mN (0.4gf)	16mN (1.6gf)
	Probe angle	90℃	90℃
	Vertical radius of guiding head	48mm	48mm
	Maximum driving stroke	17.5mm/0.75inch	
	Cutoff length	0.25mm,0.8mm,2.5mm	
Driving speed	Measuring	Sampling length = 0.25mm When Vt=0.135mm/s	
		Sampling length = 0.8mm When Vt=0.5mm/s	
		Sampling length = 2.5mm When Vt=1mm/s	
	Returning	Vt=1mm/s	
Evaluation length		1 ~ 5L selectable	
Metric/Imperial		Conversion	
Auto off		√	
Memory		7 Groups	-----
Pc interface		RS-232C	-----
Built in Li-ion battery		Rechargeable	
Operating condition	TEMP	0 ~ 50℃	
	Humidity	< 85%RH	
Dimension		140 × 52 × 48mm (5.5 × 2.2 × 1.9inch)	
Net weight		420g	



BGD 930



BGD 931

Optional accessories:

BGD 1290---RS-232 or USB cable
BGD 1291---Software
BGD 1292---Sensor for deep groove
BGD 1293---Sensor for curve surface
BGD 1294---Measuring stand

Temperature Tracker

Temperature Tracker is a user-friendly device.It takes just a few minutes to learn how the entire system works. It's excellent suited for industrial oven and laboratory oven temperature profiling. Mandatory test in Qualicoat, QIB and GSB accredited laboratories.

Temperature Tracker is mainly made up of Oven datalogger, analysis software and insulation box.

Oven datalogger: Oven datalogger is the heart of temperature tracker. It designed to measurement temperature and store them for a specified amount of time. This instrument measures continuously but only stores readings at certain intervals defined by the operator. The maximum recording period depends on the number of sensors being used and the specified recording interval.

It offers easy-to-use, high quality temperature logging for industrial paint and powdercoat cure ovens. The oven data tracker is fitted with a large display for easy menu-driven operation and quick display of measurement results.

Analysis software: allows user to analyse the logged temperature data and create detailed reports. Advanced oven profiling features like cure data analysis, ideal cure and tolerance bands, together with a wide range of display, report and printing options, make Oven Logger the most flexible temperature logging solution available.

Insulation Box: A high quality insulation box with outer shield of high-grade stainless steel. The anodized aluminum inner box is shielded with a carefully formulated mixture of insulation material, which makes the combination suitable to resist high temperatures for long time. This insulation box is absolutely silicone free, and therefore very suitable for applications in automotive and wet paint coatings.







Soft-ware

Ordering Information → Technical Item ↓	Four-Channel		Seven-Channel	
	BGD 954/1	BGD954/2	BGD 957/1	BGD 957/2
Number of Channels	4	4	7	7
Temperature range	-100℃ ~ 300℃	-100℃ ~ 500℃	-100℃ ~ 300℃	-100℃ ~ 500℃
Duration	60min for 300℃ 120min for 150℃	60min for 500℃ 120min for 300℃	60 min for 300℃ 120 min for 200℃	60min for 500℃ 120 min for 300℃
Division	0.1℃		0.3℃	0.5℃
Accuracy	0.5%		0.5%	
Storage	Every channel can store 16,000 readings. Record per seconds for 5 hours		Record per seconds for 4 hours	Record per seconds for 3 hours
Sampling period	1s, 2s, 3s, 4s, 5s, 6s, 10s, 20s, 30s, 1min programmalbe		1s, 2s, 3s, 5s, 8s,10s,12s, 20s,40s, 60s programmable	
Setting Software	① Can select sampling period ② Show the real-time Tem.curve ③ Can save many groups datas		① Can select any channel seperately ② Calibrate each channel seperately ③ Can select sampling period	
Analysis software	① Display Tem. datas; ② Calculate heating rate between tow Tem.leverl ③ Calculate total time above two different Tem ④ Calculate peak Tem. ⑤ Compare different Tem. profile; ⑥ Print Report			
Standard Disposition	◆ Oven datalogger ◆ 4 pcs temperature sensors ◆ USB cable ◆ Setting software and Analysis software ◆ Insulation box ◆ Manual		◆ Oven datalogger ◆ 7 pcs temperature sensors ◆ USB cable ◆ Setting software and Analysis software ◆ Insulation box ◆ Manual	
Size (mm)	110 × 125 × 300	135 × 155 × 300	100 × 120 × 280	130 × 160 × 300

Infrared Thermometer

These series Infrared Thermometers provide much faster and accurate readings for most surface temperature measurements. One or two laser points converge to a single spot when the unit is at the optimal distance from the object being measured.

- Non-contact measurement with laser pointer.
- Unique flat surface, mini modern housing design
- Backlighting illuminates display for taking measurements at night or in areas with low background light levels
- Low battery indication and overrange indication
- Auto data hold when trigger released and auto Power Off
- User selectable℃or℉

Ordering Information → Technical Item ↓	BGD 950/1	BGD 950/2	BGD 950/3
Range	−50~380℃	−50~700℃	−50~1000℃
Distance to Spot Size (D:S)	12:1	10:1	30:1
Emissivity	0.95	0.95	0.1~1.0step step (adjustable，step 0.01)
Accuracy	± 1.5%		± 1.0%
Response Time	<1second		<150 millisecond
Resolution	0.1℃		0.1℃
Laser Type	Single Laser		Dual Laser
Size	160mm × 82mm × 42mm		146mm × 104mm × 43mm
Weight	177g		163g



BGD 950/1



BGD 950/2/3

Digital Thermometer and Hygrometer

- Simultaneously displays temperature, humidity and time together with the function of indicating human bodycomfort
- Function of alarm setting
- Range: Indoor temperature: -30℃~50℃（-22℉~+122℉）; Outdoor temperature: -50℃~70℃（-58℉~+158℉）; Humidity: 20%~99%
- Resolution: Temperature: 0.1℃; Humidity: 1%
- Power: one 7# Alkaline battery
- Size: 11×101×21.5（mm）
- Screen Size: 81.5×64.5（mm）
- **Ordering Information:**

  BGD 945−−−Digital Thermometer and Hygrometer



Temperature & Humidity Meter

This is a professional three-in-one temperature&humidity meter. Use temperature sensing resistor to measure temperature, use precise capacitive sensor to measure humidity. It can used to measure air relative temperature, air humidity, wet bulb temperature and absolute humidity

Features:

- Fast response time
- High accuracy and high performance
- Max. hold and data hold function
- Dual display & backlight
- Dew point & wet bulb temperature

Main Technical Parameters：

- ★ Air Temperature：−30~100℃（Accuracy：±1℃~±1.5℃）
- ★ Relative Humidity：0~100%RH（Accuracy：±2%RH~±4%RH）
- ★ Dew Point Temperature：−30~100℃（Caculated by measuring relative humidity and air temperature）
- ★ Wet Bulb Temperature：0~80℃（Caculated by measuring relative humidity and air temperature）
- ★ Absolute Humdity：0~500g/mm3, 0~218.5gr/ft3（Caculated by measuring relative humidity and air temperature）
- ★ Response Time：＜15 seconds
- ★ Power Supply：9V battery（work for 48 hours）
- ★ Size/Weight：300×75×50 mm/400g
- ★ **Ordering Information:**

  BGD 943−−−Professional Temperature& Humidity Meter



Duck Billed Valve

Duck Billed Valve is mainly applicable to control discharge of discharge orifice of various vessel.It has features, such as rapidity,facility,good sealing.

★ **Ordering Information:**

- BGD 986/1−−−1 inch Duck Billed Valve
- BGD 986/2−−−1.5 inch Duck Billed Valve
- BGD 986/3−−−2 inch Duck Billed Valve



Sealing Clamper

Sealing Clamper is designed with international standard barrel and used to seal the coating barrels quickly. It can be used easily and widely!

Main Technical Parameters：

- ★ Diameter of barrelhead：300mm（18L−20L）
- ★ Thickness of barrelhead：0.4−0.5mm
- ★ The max power of clampers：800N
- ★ Power of handle working：≤680±50N
- ★ Size：858×355mm
- ★ Weight：11±1 Kg
- ★ **Ordering Information：** BGD 910−−−Sealing Clamper(20L)



Multifunctional Digital Moisture Meter

Biuged Instruments offers a series of moisture tester, they are applicable of wooden articles, building materials, wood fiber material, Chinese traditional medicine, tobacco, cotton paper, building, soil and other fiber materials.

Ordering Information → Technical Item ↓		BGD 922		
Model with suffix		P	S	PS
Sensing type		Pin type	Search type	Pin & Search type
Wood over 150 species		√	√	√
Building moisture（Range）		0–50%（Concrete）		
Measuring range	Moisture	0–80%		
	TEMP	-----		
Calibration		Automatic		
Resolution		0.1		
Display		LCD display		
Accuracy	Moisture	±（0.5n+1）		
	TEMP	-----		
Power supply		4×1.5V AAA（UM–4）battery		
Battery indicator		Low battery indicator		
Dimension		165x62x26mm		
Weight（No battery）		119g	114g	175g



BGD 922/PS



BGD 922/P

Spatulas for Paint and Ink Applications

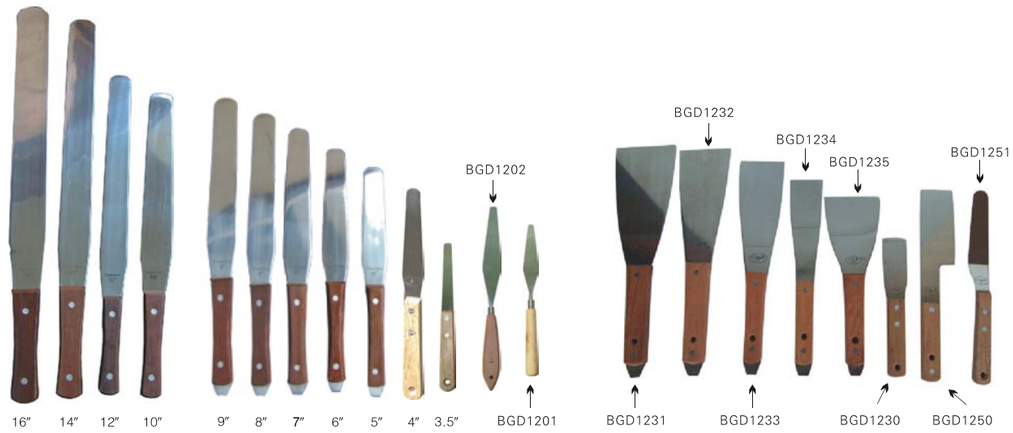
The spatulas are widely used in the Paint and Ink Applications. The different sizes of the spatulas allow the user to select the correct size of the spatulas for the applications.
They are made up of stainless steel with high tenacity. With tail knife can prize up coating container easily.

Ordering Information	Products	Overall Length（mm）	Spatula Length（mm）	Max. Spatula Width（mm）	Wooden Handle Length（mm）
BGD 1201	Rhombic Spatulas	194	114	19	80
BGD 1202	Rhombic Spatulas	270	155	26	105
BGD 1203	3.5 " Vertical Spatulas	190	90	15	100
BGD 1204	4 " Vertical Spatulas	205	105	20	100
BGD 1205	5 " Vertical Spatulas	235	125	25	110
BGD 1206	6 " Vertical Spatulas	265	145	30	120
BGD 1207	7 " Vertical Spatulas	290	170	30	120
BGD 1208	8 " Vertical Spatulas	320	200	33	120
BGD 1209	9 " Vertical Spatulas	350	230	33	120
BGD 1210	10 " Vertical Spatulas	370	250	34	120

Ordering Information	Products	Overall Length（mm）	Spatula Length（mm）	Max. Spatula Width（mm）	Wooden Handle Length（mm）
BGD 1212	12 " Vertical Spatulas	415	295	35	120
BGD 1214	14 " Vertical Spatulas	485	365	36	125
BGD 1216	16 " Vertical Spatulas	513	385	75	115
BGD 1230	3 " Flat hacking Knives	175	80	32	95
BGD 1231	6.7 " Flat hacking Knives	325	175	88	125
BGD 1232	6.5 " Flat hacking Knives	300	165	75	125
BGD 1233	6 " Flat hacking Knives	285	158	63	115
BGD 1234	5.5 " Flat hacking Knives	255	135	75	105
BGD 1235	4.5 " Flat hacking Knives	240	135	75	120
BGD 1236	Ink Knife	90	90	70	0
BGD 1250	Knife–Shaped	240	120	22	110
BGD 1251	Shovel–Shaped	250	155	45/24	95
BGD 1252	Four Colors Plastic Spatulas (S)	295	150	45	145
BGD 1253	Four Colors Plastic Spatulas (M)	295	150	60	145
BGD 1254	Four Colors Plastic Spatulas (L)	270	115	70	155
BGD 1255	White Plastic Spatulas (S)	290	185	45	105
BGD 1256	White Plastic Spatulas (M)	290	185	60	105
BGD 1257	White Plastic Spatulas (L)	290	185	76	105



BGD 1252　BGD 1253　BGD 1254　BGD 1255　BGD 1256　BGD 1257



Digital Calipers/Micrometer

Digital Caliper with high accuracy and high LCD display for easy to read, available in carbon steel & stainless steel material ;

- Zero setting at any position;
- Metric/inch interchangeable system;
- Power on/off at any position, invariable measuring origin （ZERO）;
- Display window uses special quartz glass, high scratch-resistance ;



BGD 962



BGD 960

Ordering Information → Technical Item ↓	BGD 960	BGD 961	BGD 962
Range	0–150mm（6 inch）	0–500mm（20 inch）	0–25mm
Graduation	0.01mm（0.0005 inch）		0.001mm
Value Stability	0.01mm（0.0005 inch）		0.001mm
Max moving speed	1m/s		---
Power Supply	1.5 V SRW		1.5 V SRW

Biuged Brand Test Substrates

If coatings tests are to be reliable and reproducible, they must be performed on a substrate which is reasonably consistent from test to test. Unfortunately, ordinary commercial sheet steel displays wide variations in the surface properties which affect the bonding of coatings.

The Standard Test Substrate

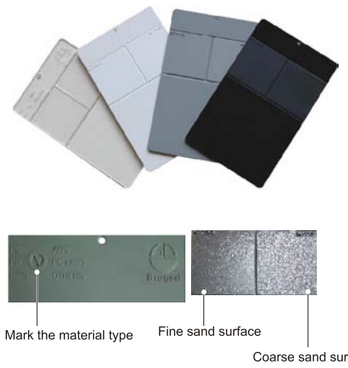
Biuged brand test substrates provide a uniform and consistent surface for testing paints, coatings and adhesives. Panels are available in a variety of substrates, surface finishes, sizes and shapes. They are used to minimize metal variability as a source of bias in critical tests and they are economical enough to be used for sales samples and batch records.

Panel Options. Panels are available in steel and aluminum, bare and pretreated. Most panels are flat and rectangular, but we do have special shapes such as automotive styling panels which mimic the side of an automobile. In addition, custom panels can be manufactured to specification.

Consistent & Convenient. The Biuged production process is specifically tailored to minimize variability of metallic surfaces. We buy all of our substrates direct from selected mills which control surface texture to our specifications. Our inventory of over a million panels means that 95% of our orders are shipped from stock.

Economical. Due to high volume production, our panels cost less than one might expect. Equally important, the con-venience of pre-cleaned, safe, standardized panels reduces the expensive time lab personnel could spend cleaning and handling panels.

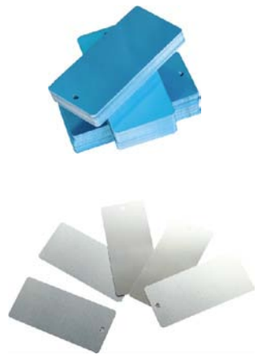
Name	Ordering Information	Size（mm）	Minimum Packing	Pretreat
Steel Panels	BGD 2310	120×50×0.5	300 pcs	Polishing
	BGD 2311	150×70×0.5	180 pcs	Polishing / hole and Circuital corner
	BGD 2312	120×50×0.8	300 pcs	Polishing
	BGD 2313	150×70×0.8	180 pcs	Polishing / hole and Circuital corner
	BGD 2314	120×50×1.0	300 pcs	Polishing
	BGD 2315	150×70×1.0	180 pcs	Polishing / hole and Circuital corner
Special Processing Steel Panels	BGD 2317	150×70×0.8	180 pcs	With Cathodic Electrophoresis paint
	BGD 2318	150×70×0.8	180 pcs	Grit blast （Ra 4.5～5.5）
	BGD 2319	150×70×0.8	180 pcs	Phosphated
Stainless Steel Panel	BGD 2341	Customized	----	304 mirror surface
	BGD 2342	Customized	----	304 brushed surface
	BGD 2343	Customized	----	316 material
Aluminum Panels	BGD 2320	120×50×0.5	300 pcs	Film Laminated
	BGD 2321	150×70×0.5	180 pcs	Film Laminated
	BGD 2322	120×50×0.8	300 pcs	Film Laminated
	BGD 2323	150×70×0.8	180 pcs	Film Laminated
	BGD 2324	120×50×1.0	300 pcs	Film Laminated
	BGD 2325	150×70×1.0	180 pcs	Film Laminated
ABS Plastic Panels	BGD 2400	88×62×2.0	500 pcs	Coarse /smooth surface
	BGD 2401	130×80×2.0	250 pcs	Coarse emery/exiguous emery/smooth surface
PC Plastic Panels	BGD 2410	88×62×2.0	500 pcs	Coarse /smooth surface
	BGD 2411	130×80×2.0	250 pcs	Coarse emery/exiguous emery/smooth surface
HIPS Plastic Panels	BGD 2420	88×62×2.0	500 pcs	Coarse /smooth surface
	BGD 2421	130×80×2.0	250 pcs	Coarse emery/exiguous emery/smooth surface
ABS+PC Plastic Panels	BGD 2430	88×62×2.0	500 pcs	Coarse /smooth surface
	BGD 2431	130×80×2.0	250 purchase	Coarse emery/exiguous emery/smooth surface



Plastic Panels



Steel Panels



Aluminum Panels

BIUGED-Charts

BIUGED INSTRUMENTS offers a wide range of drawdown cards and charts for virtually any application and coating material. Stringent equality control during the production process assures that they have the most consistent color and gloss in the industry. Test charts are easy to use and an economical substrate to test a variety of coating properties, such as opacity, spreading rate, and flow& leveling behavior. They are used for testing architectural, industrial, automotive, wood finishes or even cosmetic products（e.g. nail polish）.Depending on the material properties of the product to be tested and its usage different types of drawdown cards are available.

Selection of test charts dependent on coating technology

Depending on the types of solvent used in paint formulations a drawdown chart needs to be more or less solvent resistant. The resin type requires different solvent types and dependent on the polarity of the solvent, the organic ingredients will be more or less activated. Therefore, BIUGED offers two types of drawdown cards and charts.

Clear-coated Charts

- Are ideal for a wide range of coating systems: water and solvent borne technologies
- Guaranteed non-fluorescent paper in compliance with ASTM D344
- Repeatable color and gloss-lot after lot
- Superior adhesion characteristics, especially with latex paints
- Rugged design to prevent warping and bending after the coating is applied.
- Package is shrink-wrapped with low permeability plastic to prevent moisture absorption during shipping and storage.

Film Laminated Charts

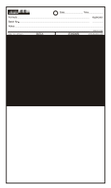
- With excellent solvent resistance
- Repeatable color and gloss-lot after lot
- Smooth, structure free surface
- Superior adhesion properties and flexibility
- Double film laminated will not warp and bend-even in high humidity environments.

Selection of test charts dependent on application

1. Opacity Charts

★ Comprised of a simple combination of black and white areas.
The reflectance of black area＜1;
reflectance of with area: 80±2.
★ With ample for reflectance measurement
★ With the lot number printed on every chart


BGD 1100
BGD 1103


BGD 1101
BGD 1104


BGD 1102/1105


BGD 1106

★ Ordering information:

Ordering Information	Description	Material	Dimensions（mm）	Qty/Box
BGD 1100	Opacity charts	Film Laminated	150 × 100	1,000
BGD 1101	Opacity charts	Film Laminated	250 × 140	500
BGD 1102	Opacity charts	Film Laminated	289 × 194	500
BGD 1103	Opacity charts	Clear-coated	150 × 100	1,000
BGD 1104	Opacity charts 2A	Clear-coated	250 × 140	500
BGD 1105	Opacity charts	Clear-coated	289 × 194	500
BGD 1106	Opacity charts 3B	Clear-coated	289 × 194	500

Opacity Measurement

Essential sales criteria for architectural paint are hiding power and yield. In other words:
---How many layers are necessary for complete coverage?
---And how many cans will be needed?

$$Opacity\ (\%) = \frac{Y\ black}{Y\ white} \times 100\ (\%)$$

100% opacity means complete hiding, no difference can be seen between the drawdown over black and white.

Procedure

A uniform paint film is applied on a black/white contrast chart. After air drying the drawdown can be objectively evaluated using the BIUGED opacity meter. The operator is menu guided through the measurement procedure and the opacity value is displayed automatically in a second.

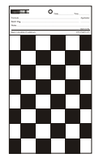
The same procedure can be applied for transparent films and plastics.

2. Checkerboard Charts/Spreading Rate Charts

Large size drawdown charts, referred to as display or spreading rate charts, were designed for visual evaluation of hiding powder. The diagonal striped patterns or the checkerboard respectively have a strong visual impact and emphasize variations in film opacity.

In order to calculate the spreading rate ASTM D344 uses Forms 8H and 10H. In this test the paint is spread uniformly on a defined test area（0.1 square meters~1 square foot）and the spreading rate is calculated from the weight and density of the applied coating.


BGD 1121


BGD 1122/1123


BGD 1110/1112


BGD 1111/1113


BGD 1114

★ Ordering information:

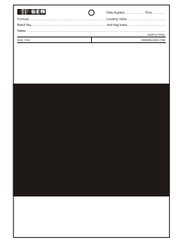
Ordering Information	Description	Material	Dimensions（mm）	Qty/Box
BGD 1110	Opacity–Display Charts	Film Laminated	250×140	500
BGD 1111	Display Spreading Charts	Film Laminated	289×194	500
BGD 1112	Opacity–Display Charts 9A	Clear–coated	250×140	500
BGD 1113	Display Spreading Charts 8B	Clear–coated	289×194	500
BGD 1114	Opacity–Display Spreading Rate 12H	Clear–coated	438×286	250
BGD 1121	Checkerboard Spreading Rate Charts	Film Laminated	250×100	1000
BGD 1122	Checkerboard Spreading Rate Charts	Film Laminated	250×140	500
BGD 1123	Checkerboard Spreading Rate Charts	Clear–coated	250×140	500

3. Sag and leveling Test Charts

This drawdown charts is designed for use with BGD 225 sagging tester or BGD 226 leveling tester.

The extra large black area allows measurements to be made over the black area only, in accordance with specifications that require the operator to ignore the leading and trailing edges of the drawdown.

★ Ordering information:
BGD 1109---Sag and leveling Test Charts（289mm×194mm；500pcs/box）

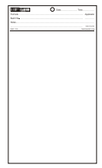

BGD 1109

4. Plain White Drawdown Charts

These drawdown charts are plain white with the coating on one side with no text or label on top.

★ Ordering information:
BGD 1132---Plain White Drawdown Charts（150mm×100mm; 1,000pcs/box）
BGD 1133---Plain White Drawdown Charts（250mm×140mm; 500pcs/box）

Biuged accepts any order for customized special charts!!


BGD 1133

Zirconia Beads

The Zirconia-beads is the ideal grinding medium produced by introducing advanced equipments and technics, widely used in the field of painting, printing ink, paper printing, packing, dye and medicine, etc.

◆ High efficiency of grinding: As the density of Zirconia beads is high, grinding kinetic energy is larger at same speed; efficiency of grinding is 2-3 times higher than that of general porcelain beads,getting better effect.

◆ Impact resistance, low consumption: As the content of ZrO_2 in TZP Zirconia beads is high, it has the advantages of high density, high toughness, low consumption, no fragmentation and no peeling, etc., as well as little pollution to grinded object; the consumption is 4-10 times lower than that of general porcelain beads.

◆ Good stability: excellent stability, resistant to acid and alkali

◆ Good fluidity: ood roundness, smooth surface, no air hole, reflecting polish, easy to clean; goodfluidity between beads; little abrasion to equipments;

◆ Low cost: The abrasion of Zirconia beads is the lowest in all grinding medium at present. Comparedwith oversea products, our Zirconia beads is lower in abrasion, favorable price, it is honored as the bestbead in the world at present. To use this product, it will greatly reduce synthesis cost for users, such asmedium consumption, electrical consumption, labor force and equipments; realize dual output and improve quality in the condition of not adding any equipment. The earlier you use it, the earlier you will get benefit.

Main Technical Parameters:

Properties	ZR64	ZR85	ZR95
ZrO_2 content	50%--60%	85%	94.5%
Density	⩾ 4.0g/cm³	⩾ 5.3g/cm³	⩾ 6.0g/cm³
Bulk	2.3g/cm³	3.3g/cm³	3.7g/cm³
Crushing strength	> 1.5KN (ϕ 2mm)	> 1.8KN (ϕ 2mm)	> 2KN (ϕ 2mm)
Mohs' hardness	8	9	9
Self consumption	⩽0.01g/Kg.h	⩽0.01g/Kg.h	⩽0.01g/Kg.h
Specification	ϕ 0.5– ϕ 7.0mm	ϕ 0.5– ϕ 7.0mm	ϕ 0.2– ϕ 3.5mm

***NOTE*:**

◆ To select Zirconia beads in types, sizes and quantity in accordance with adhesion, rigidity and dispersal and grinding requirement of the grinded materials.

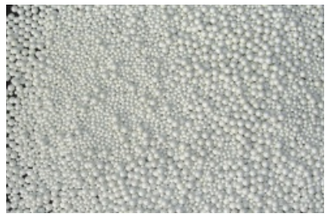
◆ To clean Zirconia beads and mill's inside before the grinding processes.

◆ To input the grinded materials firstly and a certain amount of Zirconia beads later. To add continuouslyZirconia beads till 70%~85% of the mill is full.

◆ To forbid to keep Zirconia beads running with little grinded material for a long time, The mill is easily broken when the Zirconia beads inside at high speed operation.

◆ To add fresh Zirconia beads to ensure the quality efficiency of grinded materials.

◆ **Ordering information:** BGD 1340---ZR 64 Beads (25kg)
BGD 1341---ZR 85 Beads (25kg)
BGD 1342---ZR 95 Beads (25kg)





Grinding Glass Beads

① Normal beads

As blasting, road-marking and grinding media, it has features of orystal, steady chemical change and low cost.

Main Technical Parameters:
★ Chemical composition: SiO_2 AL_2O_3 CaO MgO Na_2O
★ Proportion: 2.45g/cm³
★ Artificial Proportion: 1.5g/cm³
★ Micro-rigidity: =635kg/mm²
★ Diameters: 0.2–0.4mm; 0.4–0.6mm; 0.6–0.8mm;
0.8–1.0mm; 1.0–1.5mm; 1.5–2.0mm;
2.0–2.5mm; 2.5–3.0mm; 3.0–3.5mm;
3.5–4.0mm; 4.0–5.0mm

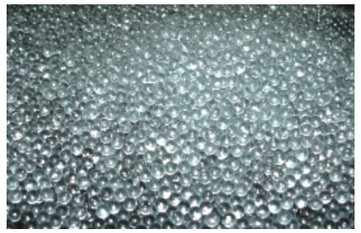


★ **Ordering information:**
BGD 1300---Normal glass beads (25kg)

② Intensive Beads

Silicate of boron grinding glass beads has features of tenacity, wear resistance, steady chemical change and 7.2 PH-value are suitable both for grinding materials with low, middle adhesion and blasting processes.

Main Technical Parameters:
★ Chemical composition:
SiO_2 AL_2O_3 CaO BaO Na_2O B_2O_3
★ Proportion: 2.5g/cm³
★ Artificial Proportion: 1.5g/cm³
★ Micro-rigidity: ⩾680kg/mm²
★ Diameters: 0.6–0.8mm; 0.8–1.0mm; 1.0–1.5mm;
1.5–2.0mm; 2.0–2.5mm; 2.5–3.0mm;
3.0–3.5mm



★ **Ordering information:**
BGD 1320---Intensive Glass Beads (25 KG/package)

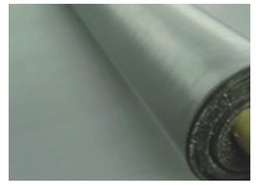
③ Standard Screen Mesh/Filter Mesh

Standard sieve (also called test screen, the standard test sieve, sieve particle size analysis, particle size calibration screen, check the screen size, sub-sample screening). Mounted on slap-type test sieve shaker (Tyler analysis of vibrating sieves and the United States (rotational separation sieve) Ro-Tap RX-29, RX-30 on the same principle) or standard screen machines used for a variety of powder materials, grain degree of composition grading. Widely used in abrasive, ground Kan, metallurgy, pharmacopoeia, chemical and building materials industry, materials, accurate particle size screening and detecation.

Moreover, Biuged also supply a series filter mesh from 2 mesh to 635 mesh which are widely used in Filter for consumer electrical goods, oil filters,humidifier filters, metallic mesh filter, ect. There are two types material: stainless steel and Nylon.

Main Technical Parameters:
★ Fine sieve frame and durable, with no leak tight,
★ Screen mesh standard sieve mesh precise number and mesh size of tags
★ Test sieves of metal perforated plate, the main test for large mesh sieve (greater than 3 mm)
★ According to international standards ISO3310-2: 1990 R20 / 3, R20, R40 / 3 series.
★ Stainless steel screen material.





★ **Ordering information:**
BGD 1376---Standard Screen Mesh
BGD 1377---Staineless Steel Filter Mesh BGD 1378---Nylon Filter Mesh

RAL Formula Guide

The RAL CLASSIC Colour Collection with its 215 colours is indispensable in many areas.

Many products are internationally available in these colours. RAL Colours with four digit numbers will continue to be important for colour decision also in the future.

RAL K5

- U-shaped protective cover.
- Full page colour area of 5cm×15cm.
- Ideally suited for colour combination and colour comparison.
- Choice of semi-matte or gloss.
- Example of a RAL Classic colour "RAL 4010"



RAL K7

The RAL K7 Colour fan deck contains all 215 colours from the RAL CLASSIC colour range and is the definitive guide for selecting and verifying colour for paint and coatings to international standards.

The RAL K7 forms part of the RAL CLASSIC collection of accurate, easy to use resources offering a simple 4-digit code system for ease of selection, making the RAL K7 a definitive guide for professional colour use

The RAL K7 Colour fan deck boasts numerous features, including:

- Contains all 215 RAL CLASSIC Colours
- Five colours per page
- Simple 4-digit coding system
- Colour swatches measure 2cm×5cm
- Fan deck size 5cm×15cm
- Gloss finish



PANTONE Plus Series Formula Guide (2026 Version)

The PANTONE Plus Series Formula Guide (Solid Coated & Uncoated) is an essential tool for printers, pre-press professionals and graphic designers and replaces the previous PANTONE Formula Guides.

The PANTONE Formula Guide (Solid Coated & Uncoated), consists of a two-volume set of swatchbooks, offering 2,614 PANTONE colours, 224 more than the previous edition, printed on coated and uncoated paper making up this two volume fan book set.

The PANTONE Formula Guide (Solid Coated & Uncoated) offers a simple chromatic arrangement of swatches, is formulated with the same 14 previous base inks and the new colours are printed with uniform ink film thicknesses for easy matching on press.

The PANTONE Formula Guide (Solid Coated & Uncoated) offers numerous features, including:

- 2,614 solid PANTONE Colours --- 224 new additions
- Same reference numbers as previous edition
- Icons indicate whether a colour is achievable in CMYK or RGB
- Includes ink mixing formulas
- Printed on coated and uncoated text-weight, FSC certified paper
- ColorChecker Lighting Indicator aids lighting evaluation
- Simple index system for easy referencing

★ **Ordering information:**

GP 1601C---Pantone Formula Guide



GP 1601C

Equipments

① Single-shaft High Speed Disperser

Single-shaft High Speed Dispersers are commonly used in chemical for mixing and distribution with variable frequency speed adjustment; Currently available for customers to choose from the ordinary or the explosion-proof models.

Items of this equipment with blade distributor, oar distributor or anchor distributor are designed on request with variable specifications of power. With hydraulic lift system, these machines' lift distance and centre distance between the base and the scattered axles.

If required, User-friendly hydraulic lift system of 180° rotation is available, it easily operated.

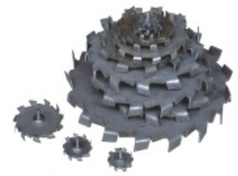


Ordering Information → Main Technical Pararmeters ↓	BGD 8011	BGD 8013	BGD 8015	BGD 8017	BGD 8018
Motor Power	7.5 kW	11 kW	15 kW	18.5 kW	22 kW
Total Power	9 kW	13 kW	17 kW	21 kW	25 kW
Working Travel（mm）	900	900	1000	1000	1200
Adjustable Speed	0～1450 r.p.m				
Suitable Container Capacity（L）	300～500	300～600	400～700	500～800	500～1000
Including Dispersing Blades（mm）	Φ250、Φ280	Φ250、Φ280	Φ280、Φ300	Φ280、Φ300	Φ300、Φ320
Overall Size （cm）	170×80×180	175×80×180	180×90×180	195×90×205	195×90×205

Dispersion Blades

Dispersion blades are mainly applied to pulverize, grind, and stir liquid, emulsion or solid-liquid material as below industrial fields: coating, paint, ink, pigment, dye, adhesive, daily chemicals, food and medicine. Dispersion blade are daily consumptive parts for dispersing machine, grinder, pulverizing mill, stirring machine, emulsifying machine, etc.

Classify Method	Dispersion Blades		
Dispersing Machine	Flat saw type	Paddle type	Disc type
Dispersing Performance	high viscosity dispersion blade	medium/low viscosity dispersion blade	Interior teeth dispersion blade for medium/low viscosity
No. of Dispersion Blade Layers	single layer dispersion blade	bilayer dispersion blade	multi–layer dispersion blade column
No. of teeth	Mulit teeth	Three teeth	
Teeth Structures	single side teeth dispersion blade	Double sides dispersion blade.	
Teeth Position	interior teeth dispersion blade	Peripheral teeth dispersion blade.	



② Dual-shaft High Speed Disperser

The perfect combination of BGD series of speed-adjustable stringed-plate dual-axle distributor and BGD series of basket-type fast high grinders and distributors enables the mixing, distribution, grind and package of materials with very high stickiness to be finished in one consecutive process at one machine, 10-20 times more efficient than ordinary distributor and grinder, Ground materials as fine as 5-10 μm, this is absolute breaking-through in the mixing, distribution, grind and package of materials with very high stickiness, and is widely used for high-glass atom ash, sticker pulp, rendering, cosmetics, food, salve, ink etc.

Characteristics:

- Stringed plates on dual-axle ensures fast mixing and dispersion.
- Rotary blade unit inside the cylinder prevents the mixture from sticking to the wall and ensures thorough dispersion
- Speed-adjust unit makes it easy to change speed.
- Cooling system in the secret compartment of the bucket provides effective protection for temperature -sensitive materials.
- Hydraulic lift.
- User-friendly service vehicle accessory to the machine eases laborintensity.







Ordering Information → Main Technical Pararmeters ↓	BGD 8021	BGD 8023	BGD 8025	BGD 8027	BGD 8028
Motor Power	7.5 kW	11 kW	15 kW	18.5 kW	22 kW
Total Power	10 kW	14.5 kW	18.5 kW	22.5 kW	26.5 kW
Working Travel（mm）	800	1000	1000	1000	1200
Adjustable Speed	0～1450 r.p.m				
Including Single-layer Stainless Steel Container（L）	2×100L	2×150L	2×200L	2×300L	2×400L
Including Dispersing Blades （Dia.mm）	170 or 180	180 or 200	200 or 210	220 or 230	230 or 250
Overall Size （cm）	155×75×175	175×80×175	175×80×175	190×85×205	190×90×205

Note: Each shaft is equipped three same diameter dispersing blades, these total six blades are distributed well-proporationed at two shafts.

③ Basket Grinding Machine

This is a new model of fast high grinder for materials with high or middling stickiness, one type with variable frequency speed adjust and the other with electric frequency speed adjust; A model of ordinary design is currently available for customers to choose from.

Characteristics:

- Basket design renders a thorough change of the traditional mode of grind
- Basket lift design makes the machine user-friendly while feeding and discharging
- Dual-blade design at the bottom of the basket frees the ground material of circulation assist, saving energy and reducing cost.
- Circulation cooling design in the secret compartment between the basket wall and inner container wall provides effective protection for temperature-sensitive material.
- Blade at the basket bottom feeding upwards, all-round interactive collision spurred by the back and cross flows and convection between the ground materials and intermediary agent in the basket renders fast grind and distribution, ensuring the fineness of ground material.
- Speed of grind is adjustable, which makes it suitable for the grind of varieties of materials and, further more, saves grind time.
- Temperature-control system precisely surveys and controls the temperature while grinding.
- Rotary blade design inside the cylinder prevents material from sticking to the wall, making the grind more thorough and the better-distributed.
- User-friendly service vehicle with machine eases labor-intensity.
- Timer relay controls grind time, making the machine more user
- Hydraulic lift.





Ordering Information → Main Technical Pararmeters ↓	BGD 8051	BGD 8053	BGD 8055	BGD 8057	BGD 8058
Motor Power	7.5 kW	11 kW	15 kW	18.5 kW	22 kW
Total Power	9 kW	13 kW	17 kW	21 kW	25 kW
Working Travel（mm）	800	1000	1000	1000	1200
Adjustable Speed	0～1450 r.p.m				
Including Double-jacket Stainless Steel Container（L）	2×100L	2×150L	2×200L	2×300L	2×300L~450L
Including Tool Car	No	Yes	Yes	Yes	Yes
Including 95% Zirconia Beads	18 kg	18 kg	28 kg	28 kg	38 kg
Overall Size （cm）	155×75×175	165×90×180	165×90×180	165×90×190	165×90×190

Standards and Relative Instruments:

ISO Standards	ASTM Standards	Other Standards	Instruments	Ordering Information	Page
ISO 37 ISO 527 ISO 1421	ASTM D638 ASTM D412 ASTM D903 ASTM D2370	EN 12311 JIS K 6251	Tensile Machine Universal Material Testing Machine	BGD 573, BGD 574 BGD 570, BGD 571	108 111
ISO 178 ISO 604 ISO 1209			Universal Material Testing Machine	BGD 570, BGD 571	111
ISO 760 ISO 6296	ASTM E203		Karl Fischer Titration Tester （Volumetric Method）	BGD 231	41
ISO 787-16 ISO 8780-5	ASTM D332-B ASTM D387		Muller Laboratory Ginrder	BGD 650	133
ISO 1409 ISO 6295	ASTM D1417	EN 14370	Interfacial Tension Tester	BGD 234	45
ISO 1514			Biuged Brand Test Substrates	BGD 23**, BGD 24** series	192
ISO 1518-1		BS 3900-E2 BS EN 13523-12	Automatic Scratch Tester（Constant-loading）	BGD 520/1	94
ISO 1518-2			Automatic Scratch Tester（Variable-loading）	BGD 520/2	94
ISO 1519		ASTM D 522	Cylindrical Mandrel Tester	BGD 561, BGD 564	96
ISO 1520		DIN 53166 DIN 53232 BS 3900	Cupping Tester	BGD 309，BGD 310	99, 100
ISO 1522	ASTM D4366	DIN 53157	Pendulum Hardness Tester	BGD 509, BGD 509/S	90
ISO 1524	ASTM D333 ASTM D1210 ASTM D1316	BS 3900-C6 BS 3900-E9	Fineness of Grind Guage Fineness of Grind Tester	BGD 241, BGD 242, BGD 244, BGD 245	19 20
ISO 1652 ISO 2555 ISO 3219	ASTM D2196 ASTM D2983	BS 5350 BS 6075 JIS K 7117	Rotary Viscometer Rheometer	BGD 151, BGD 162, BGD 164, BGD 165, BGD 168	7, 8 9 10
ISO 2115	ASTM D2354		Min.Film Forming Temperature Tester	BGD 452	29
ISO 2178 ISO 2360 ISO 2808 Method 7	ASTM D1186 ASTM D1400 ASTM D7091	DIN EN ISO 19840	Dry Film Thickness Gauge	BGD 545, BGD 546， BGD 547	79
ISO 2808 Method 1A		ASTM D 4414	Wet Film Comb Thickness Gauges	BGD 531	78
ISO 2808 Method 1B		ASTM D 1212 Method A	Wet Film Rolling Wheel Thickness Gauges	BGD 532	78
ISO 2808 Method 1C			Analog/Digital Thickness Gauge	BGD 963, BGD 964	77
ISO 2808 Method 6B	ASTM D4138		Paint Inspection Gauge	BGD 548	81
ISO 2409 ISO 16276-2	ASTM D3359 ASTM D3002	BS 2409 DIN 2409 EN 2409	Cross Hatch Adhesion Tester Cross Cutting Ruler Automatic Cross Hatch Adhesion Tester	BGD 502, BGD 504 BGD 503 BGD 535	82 83 84
ISO 2431	ASTM D5125		ISO Flow Cups	BGD 128	3
ISO 2470-2 ISO 2471 ISO 11475	ASTM E 313	DIN 53186	Whiteness Meter	BGD 584, BGD 586	76, 75
ISO 2811-1	ASTM D1475	DIN 53217 BS 3900-A 19 DIN 53217	Specific Gravity （SG）Cups	BGD 296	23
ISO 2811-4			Pressure Density Cup（Pyknometer）	BGD 297	24
ISO 2813 ISO 7668	ASTM D523	DIN 67530	Glossmeter	BGD 512, BGD 513, BGD 514, BGD 515, BGD 516, BGD 518	---- 64 63
ISO 2815		DIN 53153 BS 3900-E9	Buchholz Indentation Hardness Tester	BGD 510	92
ISO 2884-1		ASTM D 4287	Cone-plate Viscometer	BGD 182	13
ISO 2884-2			Rotothinner	BGD 180	7
ISO 3233	ASTM D2697		Intelligent Percentage Volume of Non-volatile Matter Tester	BGD 196	40
ISO 3248			Precise Oven	BGD 80* Series	140
ISO 3251 ISO 787-2	ASTM D2369 ASTM D5403		Fast Moisture Tester	MB Series	39
ISO 3668 ISO 13076	ASTM D1729		Color Assesment Cabinet	BGD 274, BGD 275, BGD 276	31
ISO 3679 ISO 3680	ASTM D3278 ASTM D3828		Automatic Flash Point Tester	BGD 240	44
ISO 4287		DIN 4768	Roughness Tester	BGD 930, BGD 931	186
ISO 4611 ISO 7253 ISO 9227	ASTM B117 ASTM B368 ASTM B380 ASTM D1735 ASTM G 85-11	DIN 50021	Salt Spray （Fog） Cabinets Cyclic Corrosion Test（CCT&CRH）Cabinets	BGD 880, BGD 881, BGD 882, BGD 883, BGD 884, BGD 885, BGD 886, BGD 887, BGD 888	160 158 ----
ISO 4624 ISO 16276-1	ASTM D4541 ASTM D7234	EN 13144	Pull off Adhesion Tester	BGD 500, BGD 500/S	86
ISO 4630-1	ASTM D1544		Gardner Color Comparator with C Illuminant	BGD 425, BGD 428	32
ISO 6270			Condensation Chamber	BGD 875, BGD 876	152,153
ISO 6272.1			ISO Impact Tester	BGD 306	98
ISO 6272.2	ASTM D2794 ASTM D3029 ASTM D4226 ASTM D5420	JIS-K5400	Dupont Impact Tester Heavy-duty Impact Tester	BGD 301 BGD 305	99 98
ISO 6504-3	ASTM D2805 ASTM E97	DIN 55984 BS 3900 D6/D7	Reflectance Meter/Opacity Meter	BGD 581, BGD 582, BGD 583	26, 27

ISO 6819 ISO 6860	ASTM D522 ASTM D1737	BS 3900-E11 DIN 53150 DIN 66669	Conical Mandrel Bend Tester	BGD 566	97
ISO 7619	ASTM D2240	DIN 53505 BS EN ISO 868 JIS K 6253	Shore Hardness Meter	BGD 935	92
ISO 7783	ASTM D1653		Perme Cup（Water Vapor Permeability）	BGD 340	61
ISO 7784-1			Turnable Abrasion Tester	BGD 522/S	104
ISO 7784-2 ISO 5470 ISO 9352	ASTM D1044 ASTM D3389 ASTM D4060		Turnable Abrasion Tester	BGD 523/S	104
ISO 8130-13			Laser Particle Size Analyzer	BGD 250, BGD 251	21
ISO 9117-4	ASTM D5895 Method A		Line Drying Time Recorder	BGD 261, BGD 262	28, 29
ISO 11341 ISO 16474-1 ISO 16474-2 ISO 4892.1 ISO 4892.2	ASTM D3451 ASTM D3794 ASTM D6577 ASTM D6695 ASTM G151 ASTM G155	SAE J 2412 SAE J 2527	Xenon Chamber Tester	BGD 860, BGD 867, BGD 862, BGD 862 Plus	176, 178 180
ISO 11664	ASTM D2244 ASTM E1164 ASTM E1331 ASTM E1347	DIN 5033 DIN 5036 DIN 6174	Colorimeter Spectrophotometer	BGD 551, BGD 555, BGD 556 BGD 557, BGD 558, BGD 559	---- 68, 70
ISO 11997			Cyclic Corrosion Test（CCT&CRH）Cabinets	BGD 885, BGD 886, BGD 887, BGD 888	158
ISO 11998		DIN 13300 BS 3900-F17	BGD 526/2 Wet Abrasion Scrub Tester	BGD 526/2, BGD 526/S BGD 526/T	101
ISO 12137	ASTM D2197 ASTM D5178		Mar Resistance Tester	BGD 536	95
ISO 12644	ASTM D4040		Falling Rod Viscometer	BGD 611	116
ISO 13320	ASTM E1458		Laser Particle Size Analyzer	BGD 248, BGD 249 BGD 250, BGD 251	---- 21
ISO 13468 ISO 14782	ASTM D1003		Haze Meter	BGD 550/1 BGD 550/2	74
ISO 13803	ASTM E430		Haze Glossmeter	BGD 514/2, BGD 516/2	64
ISO 15184	ASTM D3363	BS 3900-E19	Pencil Hardness Tester	BGD 505, BGD 506, BGD 507/S	89 87, 89
ISO 15989	ASTM D724 ASTM D5946		Contact Angle Measuring Instrument	BGD 190	46
ISO 16474-1 ISO 16474-3 ISO 4892-1 ISO 4892-3	ASTM G151 ASTM G154 ASTM D4329 ASTM D4587	BS 2782 SAE J 2020 JIS D 0205	UV Light Accelerated Weathering Tester	BGD 856	168
ISO 16862	ASTM D3730 ASTM D4400		Sagging Tester	BGD 225	24
ISO 17132	ASTM D4145	EN 13523-7	T-bend Tester	BGD 568	97
ISO 17872			ISO Scratching Tool Automatic Scribe Marks	BGD 1285 BGD 539	164 165
ISO 22557		DIN 55656	Hardness Test Pencil	BGD 511	93
ISO 23169			On-site Wet Scrub Resistance Tester	BGD 538	----
	ASTM C346 ASTM C584 ASTM D2457		Special Glossmeter	BGD 517	----
	ASTM D365 ASTM D1200		Ford Cups	BGD 125	2
	ASTM D562 ASTM D1849 ASTM D2243	BS 3900-A7-1	Krebs Stormer Viscomter	BGD 184, BGD 186, BGD 187	16 17
	ASTM D823 Method A		Automatic Panel Spray Cainet	BGD 227, BGD 370	56, 60
	ASTM D823 Method C		Automatic Film Applicator	BGD 218, BGD 219	54
	ASTM D823 Method E ASTM D3258		Applicator	BGD 201-208, BGD 212, BGD 214,BGD 215	48-51 52
	ASTM D968 ASTM D2205		Falling Sand Abrasion Testers	BGD 529	107
	ASTM D1218	DIN 51423	Abbe Refractometer	BGD 252	23
	ASTM D2486		Wet Abrasion Scrub Tester	BGD 526/1F, BGD 528	101
	ASTM D2801		Leveling Tester	BGD 226/1	25
	ASTM D3450		BGD 526/3 Wet Abrasion Scrub Tester	BGD 526/3, BGD 528	101
	ASTM D4138		Paint Inspection Gauge	BGD 548	81
	ASTM D4212 ASTM D816 ASTM D1084		Zahn Cups	BGD 126	4
	ASTM D4213		Wet Abrasion Scrub Tester	BGD 526/4, BGD 528	101
	ASTM D4752	NCCA11-18	Solvent Rub Resistance Tester	BGD 521	103
	ASTM D4828		Wet Abrasion Scrub Tester	BGD 526/5, BGD 528	101
	ASTM D4942		Digital Emulsification Tester	BGD 675	118
	ASTM D5264		Rub Resistance Tester	BGD 521	103
	ASTM D8380		Abrasion Resistance Tester for Touch Screen Coaitngs	BGD 537	106
	ASTM F2357-04		RCA Paper Abrasion Wear Testers	BGD 530	107
		BS 3962-6	Cross Cutting Rule	BGD 503	83
		NYPC	Leveling Tester	BGD 226/2	25
		DIN 53211	DIN Flow Cups	BGD 127	3
		DIN 53778	Wet Abrasion Scrub Tester	BGD 526/6, BGD 526/T	101
		DIN 55667	Conductivity Meters		