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2022 English Catalogue

Paint, Ink and Coating Instruments

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Testing Instruments
For Paint, Ink and Coating

Biuged®

TÜV NEDERLAND

Solvica B.V.

Subsidiaries of Solvica Group Holding B.V.

Dronten

The quality management system of **Solvica B.V., subsidiary of Solvica Group Holding B.V.** and the application thereof complies with the requirements as stipulated in the standard:

NEN-EN-ISO 9001:2015

Evaluation of the quality management system took place in accordance with TÜV Nederland's certification regulations for the field of application:

Distribution of testing equipment and production machinery for the chemical industry.
Development of testing equipment for the chemical industry.

This certification is subject to annual evaluation by TÜV Nederland.

This sub-certificate is part of the certificate with the registration number 25913/2.2

Registration number:	25913/2.6
Start date certificate:	24-06-2019
Certificate valid until:	24-06-2022
Date of first certificate:	24-06-2016

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MS&T SYS. RvA C 078

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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℃ (77℉).
- 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

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)	25–200	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≤0.5μm) 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	

finished (Ra≤0.5m) for hig

◆ 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 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 D 816, ASTM D 1084, ASM D 4212.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
Orifice (mm/inches)	1.98/0.08	2.74/0.11	3.76/0.15	4.27/0.17	5.28/0.21
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

④ 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

⑤ 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
★ 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)
BGD 1272----Din Flow Cup Nozzles

⑥ Stand For Flow Cup

It is important for any flow cup to be level for the flow cup with its sample during testing of sample viscosity. Biuged instruments offers a simple type stand. It is made up of three adjustable aluminum pole, and glass plate with a spirit level.

Ordering information:

BGD 130---Square Stand

BGD 131---Tripod Stand

BGD 132---Stainless Steel Stand

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

BGD 130

BGD 131

BGD 132

BGD 133

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 Inspeciton 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.

① 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 accord 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：6r/min,12r/min,30r/min,60r/min
★ Measuring Error：±5%（Newtonian fluids）
★ Electrical Power：220V/50Hz
★ Weight：7.9Kg
★ Dimensions：410×350×440mm（L×W×H）
★ **Ordering Information:**
BGD 151/1--- Dial Reading Rotary Viscometer
BGD 1601----Low Viscosity Adapter（1～10 mPa.s）

Rotors

② Intelligent Touch-screen Rotary Viscometer（Basic）

Intelligent Touch-screen Rotary Viscometers are upgraded from old digital viscometers. They are equipped a 5 inch touch screen with a powerful human-machine interface , easy to use and can show many testing parameters. They use a MCS-51 series computer to constantly control the rotation speed and the whole testing process. Finish viscosity measurement automatically under controlling of computer and output test results to screen. They can be used to measure viscous resistance and absolute viscosity of liquid, and widely applied in the field of petri chemistry, medicine, food, light industry, textile industry, scientific research, etc.

Features

- ◆ Small size, good stability, high precision and good anti-interference.
- ◆ With Biuged patents, enable multiple sampling in one rotation. Other competitor only sample one time in one rotation.
- ◆ Rotate by high sub-division stepper motor driver, with accurate speed, low noise, stable movements. And the change of AC power frequency don't influence viscosity measurements.
- ◆ For thixotropic Non-Newton fluid, timing function of instrument can ensure to get a good consistent testing results.
- ◆ Dirven by stepper motor directly, convenient to change speed , display rotating speed clearly, good reliability and no shaking.
- ◆ 5 inch high definition touch scree display viscosity, speed, torque percentage, max. measurement range under current rotor and speed.
- ◆ Display continuous change of viscosity，Alarm for over measuring range.
- ◆ Linear Calibration to full range by computer, measurement precision is ±1.0% of full range.
- ◆ Switching adapter, wide range power supply input（100V-240V） for good anti-interference
- ◆ Anti-static shell and PC material lifting pole
- ◆ Durable new design with small shaft
- ◆ ARM chip processor, processing data more quickly
- ◆ Convert freely between various viscosity units , dynamic viscosity convert kinematic viscosity automatically
- ◆ Accompanied with detailed operation instruction and correction function for viscosity coefficient.
- ◆ Calibrated by user
- ◆ Built-in RTD temperature sensor to monitor sample temperature in real time.
- ◆ Come with RS 232 interface, can print measuring data by mini-printer with less labor.

Main Technical Parameters：
★ Rotors：Four rotors---No.1，No.2，No.3，No.4
★ Measuring Range：BGD 152/1S---10～100，000（10^5）mPa.s
BGD 152/2S---10～2，000，000（10^6）mPa.s
★ Rotate speed： BGD 152/1S---6r/min,12r/min,30r/min,60r/min
BGD 152/2S---0.3 r/min , 0.6 r/min,1.5 r/min,3r/min, 6r/min, 12r/min,30r/min,60r/min
★ Measurement Precision： ±1.0 % of full range（Newtonian fluids）
★ Measurement Repeatablity： ±0.5 % of full range（Newtonian fluids）
★ Electrical power：220V/50Hz
★ Weight：10Kg
★ Dimensions：308mm×300mm×450mm.（L×W×H）
★ Optional Accessories：Mini printer, Thermoses, Standard oils etc（see page 15）
★ **Ordering Information:**
BGD 152/1S---Intelligent Touch-screen Rotary Viscometers（10-100,000mPa.s）
BGD 152/2S---Intelligent Touch-screen Rotary Viscometers（10-2,000,000mPa.s）

③ Intelligent Touch-screen Rotary Viscometer（Professional）

BGD 155/S series professional viscometers are newest full touch screen products which are developed from Biuged BGD 155 viscometers. Add more functions as below on the base of BGD 155 viscometrs.

◆ 7 inch high definition touch scree, easy to operate and display rich information. Powerful human-machine interface and various humanized operation menu for conversion.

- ◆ Anti-static shell and PC material lifting pole
- ◆ Build-in temperature probe RTD
- ◆ ARM chip processor: higher data processing speed
- ◆ New designed durable small axles
- ◆ Come with a gigabit ethernet interface to transfer data, reliable and quick.
- ◆ Come with USB interface, support operate to save measurement through external disk U: single point, continuous and timed saving ways for option.
- ◆ Come with RS 232 interface, can print measuring data by mini-printer with less labor.
- ◆ Calibrated by users themselves, temperature and viscosity correction factor are protected by password, also can be modified by user when they have reliable and accurate data.
- ◆ Can measure viscosity by infinitely variable speed , input any speed, the instru-ment would display the max. Measuring range under different rotors. Convenient for user to choose suitable testing parameters.
- ◆ Convert freely between various viscosity units , dynamic viscosity convert kinem-atic viscosity automatically
- ◆ Accompanied with detailed operation instruction

Main Technical Parameters：

Ordering Information → / Parameters ↓	BGD 155/1S	BGD 155/2S	BGD 155/3S
Measurement Range (mPa.s)	10–600,000 (600K)	10–6,000,000 (6M)	100–80,000,000 (80M)
R.P.M (per min)	1–60	0.1–100（infinitely variable speed）	
Rotor Amount	No.1, No.2, No.3, No.4 are standard configurations (#0 is optional)		
Measurement Accuracy	±1.0% (of the full range)		
Repeatability	±0.5%		
Power Supply	Power Supply Adapter (input 110/240V 50Hz		
Optional Accessories	BGD 1601---Low viscosity adapter （the No.0 rotor） BGD 1602---Small sample adapter （comes with NO.21、NO.27、NO.28、NO.29 rotors） BGD 1603---Mini single color printer BGD 1606---Viscometer data collection and graphing software		

Note:

1. If customer need the small sample adapter, the machine would come with NO.21、NO.27、NO.28、NO.29 rotor（the normal rotors are No.1, No.2, No 3, No 4）. Please clarify before ordering if extra rotors are required.
2. If selected the small sample adapter, the measurement range would be as below:
   BGD 155/1S：10-100,000 （*100K*）*mPa.s*
   BGD 155/2S：10-1,000,000 （*1M*）*mPa.s*
   BGD 155/3S：50-10,000,000（*10M*） *mPa.s*

④ Programmable Touch-screen Viscometer（Rheometer）

BGD 157 and BGD 158 series Programmable Viscometers are very helpful for R&D researchers, besides can measure the sample viscosity under a certain speed and rotor, operator can set different shear rate, shear stress to fully know the sample rheological behavior.

Features

- ◆ Display sample shear rate and shear stress
- ◆ Continuous viscosity testing and sound alarm when beyond measurement range
- ◆ 7 inch high definition touch scree , easy to operate and display rich information. Powerful human-machine interface and various humanized operation menu for conversion.
- ◆ Anti-static shell and PC material lifting pole
- ◆ Build-in temperature probe RTD
- ◆ ARM chip processor: higher data processing speed
- ◆ New designed durable small axles
- ◆ Come with a gigabit ethernet interface to transfer data, reliable and quick.
- ◆ Come with USB interface, support operate to save measurement through external disk U: single point, continuous and timed saving ways for option.
- ◆ Come with RS 232 interface, can print measuring data by mini-printer with less labor.
- ◆ Calibrated by user, temperature and viscosity correction factor are protected by password, also can be modified by user when they have reliable and accurate data.
- ◆ Convert freely between various viscosity units , dynamic viscosity convert kinematic viscosity automatically
- ◆ Linear calibration by a computer
- ◆ Power supply: 100V-240V, powerful anti-interference
- ◆ Accompanied with detailed operation instruction
- ◆ Professional BGD 1608 programmed analyse software for option, can display sample rheological curve

Main Technical Parameters：

Ordering Information → Parameters ↓	BGD 157/S	BGD 158/S
Measurement Range (mPa.s)	BGD 157/1S: 1–2M BGD 157/2S: 100–13M BGD 157/3S: 200–26M BGD 157/4S: 800–104M	BGD 158/1S: 1–6M BGD 158/2S: 100–40M BGD 158/3S: 200–80M BGD 158/4S: 800–320M
R.P.M (per min)	0.3–100	0.1–250
Rotor Amount	**BGD 157(8)/1** : four rotors–––No.1, No.2, No.3, No.4 (#0 is optional) **BGD 157(8)/2**、BGD **157(8)**/3、BGD **157(8)**/4: six rotors –––No.2, No.3, No.4,No.5, No.6, No.7 (No.0 and No.1 for option)	
Measurement Accuracy	±1.0% (of the full range)	
Repeatability	±0.5% (of the full range)	
Power Supply	Power Supply Adapter (input 110/220V; 50 /60Hz; output 15V 1.2A)	
Optioal Accessories	BGD 1601–––Low viscosity adapter （No.0 rotor） BGD 1602–––Small sample adapter（comes with NO.21、NO.27、NO.28、NO.29, and the max. measure range would be reduce one–sixth） BGD 1603–––Mini single color printer BGD 1608–––Viscometer data collection and programmed analyses software	

(M=1million)

⑤ Programmable Touch-screen Viscometer with Temp. Control

Programmable Touch-screen Viscometers with Temperature Control combine viscosity measurement and temperature control in one machine. It break the current way to measure viscosity which need use thermostatic bath, viscometer and small amount sample adapter separately.

Measuring sample's viscosity change under different conditions is very useful for estimating its rheological behavior, while controlling sample temperature precisely is helpful for getting an accurate and comparable test result.The most obvious advantage of this machine is controlling sample temperature precisely during the whole test. Its temperature controlling system consists of semiconductor and a built-in automatic optimization progamme of temperature control. The temperature controlling precision can reach ±0.1°C. Operator can control sample temperature not only by machine, but also by optional software, has a excellent flexible operation.

- ◆ Consists of 7 inch wide touch screen viscometer, small amount sample adapter （SSR）, cylindrical sample sleeve and SC4 rotor, tempeater controller.
- ◆ BGD 157 can display shear rate and shear stress, can fulfil a precise measurement under a certain shear rate.
- ◆ Only need 2ml～16ml sample，the cylindrical structure of SC4 rotor can offer a precise viscosity measurement
- ◆ Electrical lifting and presice location, SSR is easy assembly and disassembly, convenient to clean.
- ◆ SSR fits temperature controller closely, can ensure a precise constant temperature to sample.
- ◆ Small amount sample, rotor stir action can minimize the non-uniformity of sample temperature, shorten greatly sample hydrothermal time.

The other features of Viscometer is same as Programmable Touch-screen Viscometer.

Main Technical Parameters：

Ordering Information → Parameters ↓	BGD 156/TS (DV–Ⅰ)	BGD 157/TS (DV–Ⅱ)
Measurement Range (mPa.s)	BGD 156/TS1：5–330K BGD 156/TS2：50–3.3M BGD 156/TS3：100–6.6M BGD 156/TS4：400–26.4M	BGD 157/TS1：5–1M BGD 157/TS2：25–10M BGD 157/TS3：50–20M BGD 157/TS4：800–80M
R.P.M (per min)	0.3–100	0.1–200
Functions	Measure viscosity	Measure viscosity, shear rate, shear stress
Software（Optional）	BGD 1607 Data collection and graphing software	BGD 1608 Data collection and graphing software
Temp.Control Method	Set single point temperature	Rise temperature by programme
Rotor Amount	Standard：SC4–21#、27#、28#、29# （SC4–14、15、16、18、25、31、34 is optional）	
Sample	2–16ml	
Measurement Accuracy	±1.0% (of the full range)	
Repeatability	±0.5% (of the full range)	
Temperature Range	–1℃～150℃（precision ±0.1℃）	
Power	Input：AC100–240V, 50Hz/60Hz；Output：DC17V 1.2A	
Package Weight	20KG	
Package Size	490mm×360mm×600mm	

⑥ High-temperature Intelligent Touch-screen Viscometer

This high temperature intelligent touch-screen viscometer comes with a heating device（thermosal） which can heat sample to a appointed temperature. It is used to test hot melt adhesive, asphalt, paraffin and hot polymer.

◆ 7 inch high definition touch scree , easy to operate and display rich information. Powerful human-machine interface and various humanized operation menu for conversion.

◆ Anti-static shell and PC material lifting pole

◆ Simple operation for temperature control, sample container with thermal insulation and steady temperature control

◆ ARM chip processor: higher data processing speed

◆ New designed durable small axles

◆ Come with a gigabit ethernet interface to transfer data, reliable and quick.

◆ Support external storage: single point, continuous and timing data

◆ Calibrated by user, temperature and viscosity correction factor are protected by password, also can be modified by user when they have reliable and accurate data.

◆ Can measure viscosity by infinitely variable speed , input any speed, the instrument would display the max. measuring range under different rotors. Convenient for user to choose suitable testing parameters.

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

◆ Accompanied with detailed operation instruction

Main Technical Parameters：
★ Measurement Range (mPa.s)： two ranges for optional (also can be customized) as below:
① For medium viscosity sample： 50–10M(mPa • s/cP)
② For low viscosity sample： 5–1M(mPa • s/cP)
★ Rotors： SC4–21#，27#，28#，29# four spindles; Optional: SC4–14, 15, 16, 18, 25, 31, 34
★ Rotate speed： 0.1~200 RPM (stepless speed)
★ Measurement Accuracy： ±1.0 % (of the full range)
★ Repeatability： 0.2 % (of the full range)
★ Thermosal Temperature Range： RT+10℃ ~ 250℃ or RT+10℃ ~ 500℃ (precision 0.1℃)
★ Electrical power： 110V&220V/50Hz&60HZ
★ **Ordering Information:**
BGD 155/TS1–––High–temperature IntelligentTouch–screen Viscometer (RT+10℃ ~ 250℃)
BGD 155/TS2–––High–temperature IntelligentTouch–screen Viscometer (RT+10℃ ~ 500℃)

⑦ Cone and Plate Viscometers

Most of paint and coatings are non-Newtonian fluids, its viscosity would show typical changes when applied with roller, brush or spray gun under high shear rates.

BGD 159 series Cone and Plate Viscometers designed by ISO 2884, ASTM D 4287 and BS 3900, can offer from 10,000S^{-1} to 12,000S^{-1} shear rates.

Features:

◆ 7 inch touch screen with powerful human-computer interactive interface and rich information, easy to operate

◆ Interchangeable cones, simple to install and easy to clean

◆ Choice of shear rate. Standard speeds include 750 and 900 rpm to provide shear rate at 10,000 sec^{-1}.

◆ only need small sample amount (< 1 mL), simplifies testing

◆ Build-in PT100 temp. Probe

◆ ARM chip processor and Gigabit Ethernet port ensure higher data processing speed and rapid& stable data transfer

◆ New designed durable axle, anti-static shell and metal lifter

◆ Come with heating and temp. control system, can set sample plate temperature from -1℃ to150℃ or 5℃ to 150℃

◆ Variety of viscosity units and auto switch between dynamic and kinematic viscosity

◆ Calibration by user: temperature and correction factor protected by password

How to choose your suitable Viscometer?

1. Specify one speed or shear rate if this is required for your method.
2. Indicate viscosity range.
3. Select the temperature range that best suits your application: -5℃ to120℃（L Type） or RT+5℃ to 300℃（H Type）
4. Choose from 10 cones for multiple viscosity ranges

BGD 159/1-3

BGD 159/4

Main Technical Parameters：

Ordering Information → Parameters ↓	BGD 159/1 (400 RPM)	BGD 159/2 (750 RPM)	BGD 159/3 (900 RPM)	BGD 159/4 (@5–1000 RPM)
Cone No.：CAP-01 Shear Rate：13.3N Sample Volume：67μL	47–469 mPa.s	25–250 mPa.s	20–208 mPa.s	20–37,500 mPa.s
Cone No.：CAP-02 Shear Rate：13.3N Sample Volume：38μL	90–938 mPa.s	50–500 mPa.s	40–417 mPa.s	37–75,000 mPa.s
Cone No.：CAP-03 Shear Rate：13.3N Sample Volume：24μL	180–1,875 mPa.s	100–1,000 mPa.s	80–833 mPa.s	75–150,000 mPa.s
Cone No.：CAP-04 Shear Rate：3.3N Sample Volume：134μL	300–3,750 mPa.s	200–2,000 mPa.s	170–1,667 mPa.s	150–300,000 mPa.s
Cone No.：CAP-05 Shear Rate：3.3N Sample Volume：67μL	600–7,500 mPa.s	400–4,000 mPa.s	300–3,333 mPa.s	300–600,000 mPa.s
Cone No.：CAP-06 Shear Rate：3.3N Sample Volume：30μL	1,500–18,750 mPa.s	1,000–10,000 mPa.s	800–8,333 mPa.s	750–1,500,000 mPa.s
Cone No.：CAP-07 Shear Rate：2.0N Sample Volume：1700μL	78–787 mPa.s	N/A	N/A	32–63,000 mPa.s
Cone No.：CAP-08 Shear Rate：2.0N Sample Volume：400μL	100–1,250 mPa.s	N/A	N/A	50–100,000 mPa.s
Cone No.：CAP-09 Shear Rate：2.0N Sample Volume：100μL	1,250–12,500 mPa.s	N/A	N/A	500–1,000,000 mPa.s
Cone No.：CAP-010 Shear Rate：5.0N Sample Volume：170μL		N/A	N/A	

Note: 1.“N”=Rotor Speed

2.Each Ordering Information has two different types according to temperature range：-5℃ to120℃（L Type） or RT+5℃ to 300℃（H Type）

⑧ Portable Digital Viscometer

These portable digital viscometers are developed by Biuged after special requests by customers. It adopts brand new design and can be supplied by both AC and DC power（lithium cell battery, can be used continuously for 8 hours）. It is easy to operate, just insert the viscometer into sample then begin to test. It can be used to test sample quickly and conveniently on site, in the laboratory and on the factory production line.

- ◆ Controlled by micro-computer, with a friendly operator interface.
- ◆ With full range and every grade linearity correction
- ◆ LCD screen, skidproof handle design and alarm when over range
- ◆ Screen show directly sample temperature, viscosity, rotary speed,

Percent torque, No.of spindle and the maximum viscosity which can be tested at current rotary speed and spindle.

BGD 161

BGD 160

Main Technical Parameters：

Ordering Information→ Parameters ↓	BGD 160/1 (BGD 161/1)	BGD 160/2 (BGD 161/2)	BGD 160/3 (BGD 161/3)
Measurement Range (mPa.s)	25–150, 000	50–300, 000	200–1, 200, 000
R.P.M (per min)	60、100、150、200		
Rotor Amount	Four types: B1、B2、B3、B4		
Measurement Accuracy	±2.0%(full range)		
Repeatability	1.0%		

Accessories of Viscometer

THD Series----Low Temperature Thermostatic Bath（**See page 112**）

BGD 1600----Standard Oil（**500ml/See page 15**）

BGD 1601----Low Viscosity Adapter（The 0th rotor and can measure 1.0 mPa.s sample）

BGD 1602----Small Sample Adapter（It’s specially designed for customers with small samples and requires only a quantity as small as 5~18ml; Sample cup is easily cleaned, installed, removed, and observed; Accurate data of shear rate and shear stress can be obtained for a minute analysis of the fluid characteristics of the sample; One-off sample cups are available）

BGD 1603----Mini Single Color Printer

BGD 1604----RTD Thermometer（**-20°C～150°C**）

BGD 1605----Thermoses（It has been designed to accurately measure the viscosity of heated oil, paraffin, asphalt emulsions, medicine, high polymer and similar liquid materials at high temperatures. It allows control of a sample’s temperature at a range of room temperature +300°C. It can program the intelligent thermostat and ensures its temperature fluctuation within 0.1°C. Sample dosage is as small as 10ml, and one-off sample cups are available. Standard type of SC4 spindle can be applied, which is easy to use）

BGD 1607----BGD 155 Viscometer data collection and graphing software（Automated data collection; resulting in viscometer graph, and recording measuring data each time; Allowing comparison of at most 10 history data; Output Excel documents）

BGD 1608----BGD 156-157-158 Viscometer data collection and programmed analysis software（Automated data collection and testing; resulting in viscometer graph, and recording measuring data each time；Allowing comparison of at most 10 history data; Output Excel documents; Programmable downloading, Offline working; Analyses data, draw charts and print）

BGD 1601

BGD 1602

BGD 1603

BGD 1607

⑨ 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

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 ± 0.5r/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 1600/L---67.2 KU Standard Oil
BGD 1600/M---86.3 KU Standard Oil
BGD 1600/H---106.6 KU Standard Oil
BGD 1600/T---121.5 KU Standard Oil

⑩ 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±0.5r/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 1600/L–––67.2 KU Standard Oil
BGD 1600/M–––86.3 KU Standard Oil
BGD 1600/H–––106.6 KU Standard Oil
BGD 1600/T–––121.5 KU Standard Oil

⑪ Multifunction Stormer Viscometer

B187 Multifunction Stormer Viscometer is designed in accordance with ASTM D 562. It is fully upgraded from BGD186, with more reasonable structure, simpler operation and wider application.

Features：

◆ Apply a new structural design: it can be split into portable viscometer directly, and able to meet the test requirements for production site or other various temporary application environment.

◆ Apply a new appearance design: using 7 inch industrial grade full touch screen, more clearly display and more convenient operation.

◆ Come with calibration certificate

◆ Built in infrared thermometer sensor to measure sample temperature, more convenient and more precise.

◆ Magnetic rotor enables rapid installing, dismantlement or cleaning.

◆ Designed with calibration function: the end user can calibrate regularly with standard oil, no need return to its manu-facturer. Compared with similar instruments, the cost is greatly saved.

◆ Aluminum alloy+Glass base plate, beautiful and easy to clean

Main Technical Parameters：
★ Range：40.2KU～141.0KU　27–5250 cP
★ Accuracy：±1.5% of full scale range
★ Repeatability：±1% of full scale range
★ Paddle speed：200r/min±0.5r/min
★ Volume of container：500ml
★ Power Supply：220V 50Hz
★ Overall dimensions：230mm×180mm×465mm（L×W×H）
★ Gross Weight：8.5 KG
★ **Ordering Information:**
BGD 187–––Multifunction Stormer Viscometer

Note:

The cP reading from the Krebs Stormer Viscometer is not necessarily agree with cP values measured by other instruments due to:

1. Unique shear rate of the Krebs Stormer Viscometer paddle spindle.
2. Uniqueness of the Krebs unit scale

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 small 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 kinetic viscosity（cP value）and kinematic viscosity （cSt value）, and has a very high reliability and accuracy.

Ordering Information

Ordering Information	Dynamic Viscosity（cP）	Kinematic Viscosity（mm^2/s）	Suitable for
BGD 1600/1	5	5.4	ISO Flow Cup No.3
BGD 1600/2	50	52.1	Zahn Cup No.1；Ford Cup No.2
BGD 1600/3	100	104.2	Zahn Cup No.2；ISO Flow Cup No.4 Ford Cup No.3；Iwata Cup No.2（NK–2）
BGD 1600/4	200	208.3	ISO Flow Cup No.5； DIN Flow Cup No.4；Ford Cup No.4
BGD 1600/5	500（67.2 KU）	520.8	Zahn Cup No.3 and No.4；ISO Flow Cup No.6
BGD 1600/6	1,000（86.3 KU）	1,052.3	Zahn Cup No.5；Krebs Stormer Viscometer
BGD 1600/7	5,000	5,170.6	Rotary Viscometer
BGD 1600/8	10,000	10,416.7	Rotary Viscometer
BGD 1600/9	30,000	31,039.8	Rotary Viscometer
BGD 1600/10	60,000	62,176.2	Rotary Viscometer
BGD 1600/11	100，000	103,092.8	Rotary Viscometer whose range is over 100,000 cp
BGD 1600/L	67.2 KU	––––	Krebs Stormer Viscometer
BGD 1600/M	86.3 KU	––––	Krebs Stormer Viscometer
BGD 1600/H	106.6 KU	––––	Krebs Stormer Viscometer
BGD 1600/T	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 or “Hegman”. 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 ±2μm（both of upper plan and nether plan flatness is less than 3μm）.

It confirms the below standards：***ISO 1524, ASTM D 3333, ASTM D 1210, ASTM D 1316, 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）	Ranges	Overall dimension	Graduation	Number of Grooves	Unit
Single-Channel Grind Gauge	BGD 241/0	140×12.5mm	0–15um	170×50×13mm	0.75um	1	um/ Hegman
	BGD 241/1	140×12.5mm	0–25um	170×50×13mm	1.25um	1	
	BGD 241/2	140×12.5mm	0–50um	170×50×13mm	2.5um	1	
	BGD 241/3	140×12.5mm	0–100um	170×50×13mm	5um	1	
	BGD 241/4	140×12.5mm	0–150um	170×50×13mm	7.5um	1	
Double-Channel Grind Gauge	BGD 242/0	140×12.5mm	0–15um	175×65×13mm	0.75um	2	um/ Hegman/ Mils
	BGD 242/1	140×12.5mm	0–25um	175×65×13mm	1.25um	2	
	BGD 242/2	140×12.5mm	0–50um	175×65×13mm	2.5um	2	
	BGD 242/3	140×12.5mm	0–100um	175×65×13mm	5um	2	
Wide-Channel Grind Gauge	BGD 244/1	140×37mm	0–25um	175×65×13mm	1.25um	1	um/ Hegman
	BGD 244/2	140×37mm	0–50um	175×65×13mm	2.5um	1	
	BGD 244/3	140×37mm	0–100um	175×65×13mm	5um	1	

Laser Particle Size Analyzer

BGD 249 Laser Particle Size Analyzer is a new cost-effective laser particle size analyzer designed by Biuged R&D department. It is used to measure the particle size distribution of powder or latex.

Test Principle: Light is an electromagnetic wave. When light meets with particles on it way of traveling, the interaction between light and particles will result in deviations of part of the light, which is called light scattering. The bigger the scattering angle is, the particle size will be smaller, the smaller the scattering angle is, the particle size will be bigger. The particle analyzer instruments will analysis the particle distribution according to this physical character of the light wave.

Features:

Reliable optical platform

- Use horizontal straight light path layout, no reflecting prism, light path is stable and reliable.
- Good designability for base, good consistency of light path.
- Anti-moist ability of laser power module and the stability of electric are better.
- Modular construction design, maintenance is more convenient.
- The testing performance for small particles is improved.
- The all-in-one housing design, it's dust-protected and water-proof.

Schematic diagram of optical path

- Totally enclosed design of light path system, dust pollution and external light pollution can be prevented.
- Light path adopts lens back Fourier transform structure.
- Optical source adopts He-Ne laser emitter which owns better monochromaticity, high coherence, small divergence angle and good stability compared to other laser emitters, we also adopt the patent design of integrated laser emitter which reduces heat distortion of laser tube and external mechanical vibration.
- For laser emitter, except for traditional detection of output power value, we add the stability test of output power.
- Smoothing processing technology is used to reduce the impact of power fluctuation to measurement.
- Constant current limit and filling process of laser tube are used to reduce the flash frequency to the minimum.
- Backward detector is added, the lower limit of measurement is extended to 0.1micron.
- Spatial filter is fixed by powerful permanent magnet, the pinhole is not easy to shift under the disturbance of external force, so the stability of the optical path has been greatly improved. Besides, the new designed spatial filter eliminates the laser diffraction ring more effectively, the light background of the instrument is lower, optical energy data is more accurate, it is helpful to improve the testing capability for large particles.
- Detector array adopts unique scattered light detection around a sphere surface （DAS）, the large angle detectors are placed in a spherical surface to get accurate focus of the large angle scattered light.

Advanced data collection and processing technology

- New designed data collecting board uses 32 bit CPU from famous chip design company-ARM,the CPU has the advantages of high-effective signal processing capacity and low power consumption.
- Using 8-channel simultaneous sampling to sample 16 bit ADC, the sampling frequency of frame data can reach 1 kHz.
- Using 64-channel simultaneous sampling technology and sample & hold switch with ultralow leakage current, the full scale accuracy can reach 0.15%.
- Easy to update the firmware and layout data, more convenient for maintenance and operation
- Offset function of electric background, it can help to get more accurate optical energy data.

BGD 1168

★ **Ordering Information**:

BGD 249––– Laser Particle Size Analyzer
BGD 1168––– Circulating Small sample Feeding System (Optional)

Software Function:

- SOP standardization operating procedure function, analysis & testing process standardization
- Multiple distribution models：Rosin-Ramler mode, general mode, enhanced mode, Single mode
- Two report models：General purpose, statistics
- Two accumulative directions: small to large, large to small
- Data input function, and reports can be exported as Word, Excel format or other text format files
- Multiple reports can be opened at the same time, easy to compare among reports
- Report items can be set/ selected according to customers' requirements, also can be set as fixed report format.
- Users can define refractive index parameters by themselves, including real part and imaginary part (correspond to the absorption of sample)
- Automatic clear of electric background

Main Technical Parameters：
★ Measuring Range：0.1～750μm
★ Sample Feeding：wet dispersion
★ Repeatability：≤1%（standard sample D50）
★ Scan frequency：1 kHz（times/second）
★ Measurement Duration：1–2 minutes
★ Number of Detectors：49
★ Environmental Requirement：Temperature: 5–35℃；Humidity：＜85%
★ Report Items：Particle size distribution table & graph, Average diameter, Median diameter, SSA, etc.
★ Dimension（L×W×H）：838 × 265 × 295mm（mainframe）

Analysis Software

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：10KG	
★ Size：330mm×180mm×380mm	
★ **Ordering information:** BGD 252–––Digital Abbe Refractometer	

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.

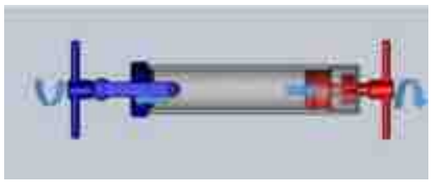
In order to use the cup, the pressure release cap is removed and the plunger withdrawn to the full extent in order to give the cup its maximum capacity for filling. The cup is held vertically with the open end at the top and the paint to be tested is poured in until it is nearly full. The cup is then 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°C） If the temperature is other than 16.7°C 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°C and 20°C. 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 desity cup comes with Calaibration 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



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, BS 3900 A19. And each desity cup comes with Calaibration 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

Procedure

1. Weight cleaned density cup empty and record weight
2. Temper density cup and test liquid9 (23°C±0.5°C)
3. ill density cup
4. ut cover on without tilting
5. Avoid air bubbles
6. Remove overflowing liquid carefully with absorbent cloth
7. Weight filled density cup
8. Calculate density

Sagging Tester

BGD 225 Sagging Tester produced by our company is in accordance with the specification of ASTM D4400 and ASTM D 3730.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 dimension：120×20×20mm（L×W×H） Weight：0.5Kg					
★ 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 120×20×20mm（length by width by height）
★ BGD 226/2：for coating thickness 10–20–40–80–160 mils
Overall dimensions：gate type 120×20×20mm（length by width by height）
★ Come with Calibration Certificate
★ Weight：0.3Kg
★ **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 Hiding Power Test Board

Hiding Power Test Board is a glass board which is printed 16 white squares and 16 black squares. Every square size is 25mm × 25mm. It is used to check the hiding power of paints. Operator brush some paint on it surface till can't see white square and black square completely, then weight the used paint and divide the whole area（200cm^2）, use g/cm^2 to express this paint hiding power capacity. It is a easy and fast method to test hiding power of paints.

Main Technical Parameters：
★ Reflectance of white square：80±2
★ Reflectance of black square：≤1
★ Overall dimension：250mm×100mm
★ **Ordering Information:**
BGD 299--- Hiding Power Test Board

② 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 298/20K---Glass Plate（K=0.002）
BGD 298/40K---Glass Plate（K=0.004）
BGD 298/70K---Glass Plate（K=0.007）
BGD 298/80K---Glass Plate（K=0.008）

Coverage in square meters per liter

K=0.004

	0	1	2	3	4	5	6	7	8	9
0	--	--	--	--	--	50.00	41.60	35.60	31.60	27.70
10	25.00	22.70	20.60	19.20	17.80	16.60	15.60	14.70	13.90	13.10
20	12.50	11.90	11.30	10.9	10.4	10.0	9.60	9.25	8.90	8.60
30	8.33	8.05	7.80	7.55	7.30	7.10	6.92	6.74	6.66	6.40
40	6.24	6.08	5.94	5.80	5.66	5.55	5.42	5.30	5.20	5.10

K=0.008

	0	1	2	3	4	5	6	7	8	9
0	--	--	--	--	--	25.00	20.60	17.80	15.60	13.90
10	12.50	11.30	10.40	9.60	8.90	8.33	7.80	7.30	6.92	6.66
20	6.24	5.94	5.66	5.42	5.20	5.00	4.80	4.63	4.47	4.30
30	4.16	4.02	3.90	3.77	3.65	3.55	3.45	3.36	3.28	3.20
40	3.12	3.04	2.96	2.90	2.84	2.78	2.71	2.65	2.59	2.55

③ Basic Reflectance Meter

BGD 581 Reflectance meter is designed and manufactured according to international standard ISO2814, ISO 3906 , ISO 6504,BS 3900 and DIN 55984

Feature:

- Small and light, real easy to be carried and used.
- Auto zero calibration.
- One 1.5V alkaline Battery can be used for almost 50 hours and 10000 readings.
- Long-term stable light source needs no replacing.

Main Technical Parameters：
★ Measure range：0～100%
★ Measurement condition：45°/0
★ Repeatability：1.5%
★ Power supply：One 1.5V alkaline Battery or rechargeable
★ Window Size：12 × 17mm（ellipse）
★ Dimension：114mm × 32mm × 64mm
★ Weight：300g
★ **Ordering Information:**
BGD 581---Basic Reflectance Meter

④ Opacity Meter/ Intelligent Reflectometer

Opacity Meter is our the newest portable products. It is controlled by microcomputer and has many functions such as measuring data, data storage, dealing with data and searching for data etc.

This meter is used to measure the opacity, or luminuous reflectance, of a grey scale. Suitable for the evaluation of a coatings hiding power, or simple shade sorting tasks of metallized films, anodized aluminium or ceramics. It can calculate the contrast ratio（opacity,see page 127） and store it. The operator can call up the date when required. It complies with ISO 2814，ISO 3906 , ISO 6504，BS 3900 and DIN 55984.

- Small and light, easily portable.
- No need to warm up and can work immediately after powering on
- Calibrate automatically：judge zero point and calibrate white board automatically
- With USB interface and software for transmitting data.
- One 1.5V alkaline Battery can be used for almost 60 hours and 100,000 reading.
- Long-term stable light source needs no replacing.
- With simple test mode and Statistics-Mode.
- Calculate the reflectance value automatically.

Main Technical Parameters：
★ Working angle：45°（irradiate），0°（receive）；CIE Illuminant C
★ Range of Measurement：0–99.9%
★ Resolution：0.1%
★ Accuracy：±1 unit or 1% of full scale
★ Repeatability：≤ 0.5%
★ Power Supply：One 1.5V alkaline battery or rechargeable
★ Window Size:12 × 17mm（ellipse）
★ Size：114 × 32 × 64mm　Weight：180g
★ Testing Environment：10℃～40℃, relative humidity should not be over 85%.
★ **Ordering Information:** BGD 583---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.

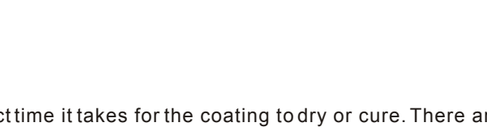
The drying time stages can be easily assessed with the graduation scale（according to traverse speed configuration）: The total time for every test can be observed from the LCD screen.

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 39）
BGD 1481–––Glass Panel Holder
BGD 2602–––Glass Panel Set（330mm × 24mm × 3mm，Set of 60）

Glass Panel Holder

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）

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 1 minute 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.
- 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 paris individual tracks, each track includes two working channels
★ Setting range for working time：1minute–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
★ Net Weight：27KG
★ **Ordering Information:**
BGD 262–––Intelligent Line Drying Time Recorder
BGD 203–––Cube Applicator（see page 39）
BGD 1481–––Glass Panel Holder
BGD 2602–––Glass Panel Set（330mm × 24mm × 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 D 2354 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 chiller
- ◆ 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 which can get the 100 micron continuous and uniform wet film with 22mm width

Main Technical Parameters：
★ Working temperature range of gradient platen：−10℃ ~ +60℃ (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：528mm (L) × 430mm (W) × 194mm (H)
★ Chiller Size：560mm (L) × 240mm (W) × 200mm (H)
★ Dry Air Generator：555mm (L) × 255mm (W) × 525mm (H)
★ Net Weight：25KG (Excludes Chiller and Dry Air Generator)
★ Power：750W
★ Ordering information:
BGD 452−−− Minimum Film−Forming Temperature Tester
BGD 1490−−− Dry Air Generator (750W)

Operation Menu

Film Forming Point

Dry Air Generator

Chiller

Color Assessment Cabinet

The cabinets supplied the supply of some 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：35Kg
★ Dimensions：710 mm × 410 mm × 570 mm

45° Normative Stand (Optional)

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	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	Wavelength 365nm
U30	Warm White Fluorescent	2 pcs	18W	3000K

◆ Ordering Information

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

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

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

Iron-cobalt Color Comparison Tester

It is designed to measure the color of the varnish, thinner and other transparent liquids. Take a certain amount of ferric chloride hydrochloric acid solution, potassium dichromate sulphuric acid solution, and cobalt chlorite hydrochloric acid solution, The above three solutions will be mixed together at a certain percentage in order to get 18 solutions with different colors and densities. Then put them into the tubes and sealed separately.

The visual method is used to assess via the comparison with a series of anvil standard tone scale solution, which is marked with the color gradation number. The result is shown in 1-18.

Main Technical Parameters:

- ★ Colorless glass tube with the internal diameter of Φ 10.75 ± 0.05mm, and the height of 114 ± 1mm.
- ★ Color comparison box(self–prepared)
- ★ The test must be taken at the temperature of 23 ± 2℃
- ★ **Ordering Information**:

BGD 420––– Iron–cobalt Color Comparison Tester

Gardner Color Comparator with C Illuminant

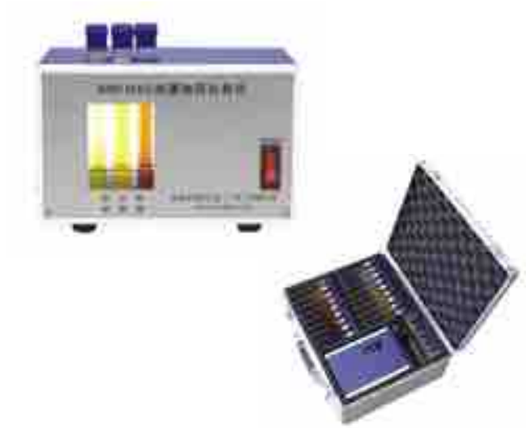
Colour variations of transparent liquids such as varnishes, solvents, resins, tensides, oils etc., May be caused by contamination or impurities, process inconsistencies, or excessive weathering.Therefore reliable and accurate measure-ments are essential to ensure consistent production standards.

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 10.65 ± 0.025mm, exterior 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



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 Table pH Meter

Ordering Information → / Main Technical Parameters ↓	BGD 284	BGD 285	BGD 286
pH Range	0.00 to 14.00 pH	0.00 to 14.00 pH	0.00 to 14.00 pH
Resolution & Accuracy	± 0.05 pH	± 0.01 pH	± 0.01 pH
mV Range	0 to ± 1400 mV	0 to ± 1900 mV	0 to ± 1900 mV
Temperature Compensation	Manual (0 to 60℃)	Automatic (0 to 100℃)	Manual (0 to 60℃)
Stability	± 0.05pH/3h	± 0.01pH/3h	± 0.01pH/3h
Power	220 ± 22V, AC, 50 ± 1 Hz		

Optional Accessories:

BGD 1171/1----Plastic combination pH electrode （for BGD 284 & 286）
BGD 1171/2----Plastic combination pH electrode （for BGD 285）
BGD 1172/1----Corrosion resistance glass combination pH electrode

② 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.

Optional Accessories:

BGD 1171/4----Plastic three-in-one combination pH electrode （for BGD 287）
BGD 1171/5----Plastic three-in-one combination pH electrode （for BGD 288）

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	148 × 29 × 14mm	
Weight	43g	

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）

Main Technical Parameters：
★ Measuring Range： −2.00~19.99 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： 120×65×31mm（L×W×H）； 180g
★ Package size and weight： 360×270×76mm（L×W×H）； 1.6kg
★ Standard kit includes：
BGD 283 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）

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, demineraliser output, reverse osmosis, stream boilers, condensate return, waste streams, boiler blow down, cooling towers, desalinisation, 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

BGD 292 Electrical Conductivity （EC） meters have double digits LCD display with big screen and blue back light, display conductivity value and temperature value； With manual or automatic temperature compensation. There are four types of electrodes for conduction cell constant： 0.01,0.1,1.0 and 10.0cm^{-1},user can select by your need. At the same time, it .have automatic switching measuring frequency, measuring ultrapure water with using K=0.01cm^{-1} titanium alloy electrode and sealing measuring cell.

Main Technical Parameters：
★ Conductivity Range： 0.001−2×10^5 μS/cm （1000MΩ.-5Ω.）
★ Display： 3 +1/2 LCD
★ Resolution： 0.05% of Full Scale
★ Accuracy： ± 1% Full Scale + 1 bit
★ Stability： ±0.67% Full Scale + 1 bit/24h
★ Temperature Compensation Range： 10−40 ℃ （standard temperature： 25℃）
★ Tested sample Temperature Range： 50−60 ℃
★ **Ordering Information：**
BGD 292−−− Table Conductivity Meter
BGD 1175/1−−−Plastic 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 μS / cm
★ Resolution： 0.01/0.1/1 μS/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： 120×65×31mm（L×W×H）； 180g
★ Package size and weight： 250×210×50mm（L×W×H）； 1.6kg
★ Standard kit includes：
BGD 293 pH/mV meter （1 unit）； Plastic conductivity electrode (1 pc)
1,413 μS/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

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）

Karl Fischer Titration Tester

These instruments use Kari-Fischer measurement to measure the trace of moisture in the coating, ink etc. It use ascertaining end-point titrimetry to measure the end-point. It can be used to measure the moisture content in chemical fertilizer medicine, foodstuff, chemical material and other industrial products.

It can absorb and transfuse liquid automatically measure the end-point and drain waste liquid automatically, and show titrimetry value by LED digital display. It has many advatages such as easy to operate, convenient to use and reliable test results etc.

Main Technical Parameters：
★ Measurement Range：0.001％～100％
★ Indication Error：≤2％
★ Resolution：0.01ml
★ End-point delay ：10±1 second.
★ Titration flux：control automatically
★ Power supply：220V /50Hz
★ Power：18W
★ Ordering Information:
BGD 232--- Karl Fischer Titration Tester

Automatic-Intelligence Karl Fischer Titration Tester

Based on Kari-Fischer principle, this instrument is the latest water titrimetry designed by newest mechanical-electronic technology with human interface. It is also featurs high precise, simple operation and usage. This instrument can determine crystal water, adsorbent water, dissociative water is gas, liquid, solid samples. It is applicable in many fields as petroleum, chemistry, pharmacy, foodstuff, agriculture, labs and others.

Main Technical Parameters：
★ Extra colorful LCD screen
★ Dynamic online guidance, simply windows-style operation
★ All results are shown in one screen, including water content, water percentage, ppm content, reagent consumption, Dynamic color titration curve display, automatic saving titration results.
★ Automatic subtract floating water, automatic track of environment floating water, to secure exact final results.
★ Stepless-speed mixing PWM, select from menu.
★ Whole system is sealed, preventing escaping of poisonous gas. automatic reagent change, automatic discharge waste water.
★ On-line parameters shown of instrument status, metric pump output, instant time shown,3-way valve status shown, drafting volume, and other parameters shown.
★ Measure Range：0.01％-100％
★ Resolution：0.01ml
★ Indication Error：≤2％
★ Power Supply：220V /50Hz
★ Terminal Time-lapse：10s～300s（Adjustable）
★ Ordering Information: BGD 233--- 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 do not offer these reagents because of delivery problems. Customers can buy it from local suppliers of Chemical reagents.

Automatic Flash Point Tester

BGD 240 Automatic Flash Point Tester is designed by rapid equilibrium closed cup method. It can rapidly test flash point of coating, paint (water-based paint), varnish, lacquer base, adhesive, solvent, Fatty acid methyl ester（FAME）, chemical reagent, flavor, spices, solid chemical products, viscous chemical products, air fuel oil, petroleum and related products.

It conforms to ISO 3679，ISO 3680，ASTM D 3278，ASTM D3828 etc

Characters

◆ Can detect the flash point at a specific temperature between -35°C and 105°C （BGD 240/1）or RT to 105°C（BGD 240/2）at average rate heating.

◆ All functions are achieved through the membrane keypad and digital display.

◆ Users can select the built-in test procedures or set its own test parameters，also can modify the preinstall program to implement custom non-standard test.

◆ Built in two test procedures：rapid balanced mode and average rate heating mode

◆ 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.

◆ A voice is prompted to user at each operation, at the end of the test there will be voice prompts, too.

◆ 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

Main Technical Parameters：

★ Flash Point Temperature Range：For BGD 240/1：–35°C to 105℃；For BGD 240/2： RT to 300℃

★ Tested Flash Point Temperature Accuracy：0.5℃

★ Sample volume：2ml

★ Heating Rate：Customize, quickest speed 5℃/min, longest duration 99min, highest temperature 100℃ （300℃）

★ Cooling Method：Built–in cooling module (without external cooler 0℃～100℃)

★ Output Interface：Computer RS232, printer (optional)

★ Size：400mm×220mm×170mm

★ Net Weight: 6 KG

★ Operate Temperature: 15℃～35℃

★ Power Supply：220/240V，50/60Hz

★ Come with Accessories：Steam source regulation component，Silicone tube，2ml injector，Thermometer 0～100℃，O–Type Seal Ring（5pcs）

★ Optional Accessories：Special injector for high viscosity（thick）sample，Powdery object injector 4ml injector，Stand oil of Flash Point （49.7℃）

★ **Ordering Information:** BGD 240/1––– Automatic Flash Point Tester（–35～105℃）
BGD 240/2––– Automatic Flash Point Tester（RT～300℃）

Automatic Interfacial Tension Tester

This instrument is designed with ISO 6295, ISO 1490, 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）.platinum plate

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	

★ **Ordering Information：** BGD 234–––Automatic Interfacial Tension Tester

Application

Film Application

For numerous products such as paint, ink, varnishes, glue and cosmetics, the reliability of many laboratory tests is directly 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

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 Four-sided Applicator

A flexible and easy to use applicator, combining 4 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 D 823-25 and made of high-grade, corrosion-resistant stainless steel 440C.

Main Technical Parameters：
★ Wet Film Width of： BGD 205→160mm； BGD 206→80mm；
★ The total length： BGD 205→190mm； BGD 206→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）

BGD 206

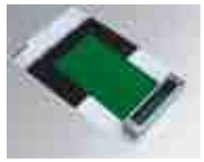
BGD 205

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）



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 10μm 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.

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

Magnetic Blade

⑦ 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）

⑧ Wire-wound Rods

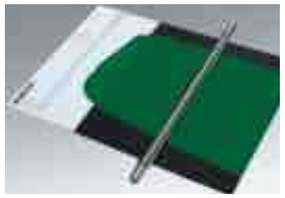
The wire and its rod from the wire-wound rods are made of stainless steel，which are corrosion-resistance. A coating （Paint or Ink）is being drawdown by a known thickness wire-rod applicator over a substrate（eg. Black/White Test Chart, Glass or Wood Panel, etc.）onto our Drawdown Board. The motion of the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

BGD 212

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 1152---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）



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 the 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 we 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 1152---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: 360 × 250 × 32.5mm
Area with hole size: 290 × 190mm
BGD 217/2--- Vacuum Film Applicator Bed
Overall size: 533 × 340 × 32.5mm
Area with hole size: 460 × 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:

- Adjustable variable speed：2~100mm/s
- High precision linear guide bar to ensure the draw down speed be more stable.
- Reasonable design bracket, easily and simply operated, and can add any load to applicate on easily bent substrates.
- Can set the starting point freely, is suitable for different size substrates
- Four types application distance can be selected freely.
- 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 218/1

BGD 218/3

BGD 219
(Touch screen)

Ordering Information → Technical Parameters ↓	BGD 218/1	BGD 218/2	BGD 218/3 (With Heating)	BGD 219
Method of fixing substrate	Vacuum adsorption			Clamp
Applicating Platform	Hard anodic oxidation aluminum with vacuum holes			Glass
Draw down vacuum bed size	360 mm × 250 mm	490 mm × 250 mm	360 mm × 250 mm	400mm × 220mm
Draw down vacuum bed size with hole	290 mm × 190mm	410 mm × 190mm	290 mm × 190mm	---
Max. application length	250mm	375mm	250mm	280mm
Adjustable Draw down Speed	2 ~ 100mm/s （adjustable variable speed ）			5 ~ 100mm/s
Carriage Holder Weight	500g × 2（1KG or 1.25KG is optional）			
Total Power	370W		750W	50W
Temperature Range	----		RT+5℃ ~ 100℃	---
Temperature Uniformity	----		±5℃	---
Power Source	220V；50Hz			
Weight	40KG	46KG	42KG	25KG
Overall Size (No vacuum pump) (L × W × H)	500 × 345 × 340mm	635 × 345 × 340mm	500 × 345 × 340mm	550 × 320 × 340mm

Note: Biuged also customzie this machine with heating function

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 spry 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）
★ Working Room Size：600 × 500 × 600 （L × W × H）
★ Exhaust Air Rate：12m/s
★ Fan：Single-phase centrifugal fan, power 370W
★ Water curtain Size：600 × 400mm （L × W）
★ Samples holder Size：595 × 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

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 the health and environment because of improper spraying operation. Biuged developed this **Automatic Test Panel Spraying Applicator** considering this situation and combined with other products in market, which has the following advantages:

◆ Integrates automatic spraying and dry spraying filtration technologies, and the closed spraying keeps the operators and mist completely separated, which is healthy and environmentally friendly;

◆ Equipped with air inlet filter system to ensure that the spraying processes cannot be polluted by external environment.

◆ The exhaust gas of the spray will pass through a specially designed double exhaust filter, it will maximum to prevent the spraying operation from polluting the environment.

◆ Dual spray gun, with cross wet spray processes.

◆ Applied Imported Graco automatic spray guns, it can automatically adjust a variety of spraying parameters, such as spraying range, atomization, feeding pressure and ultra accurate coating flow rate;

◆ Compared with the guns of gravity type and suction type , the applied Spray guns with pressure feed design is more convenient to adjust, and has nothing to do with the supply air pressure (atomization pressure) of the spray gun, and the spray rate is more stable and accurate

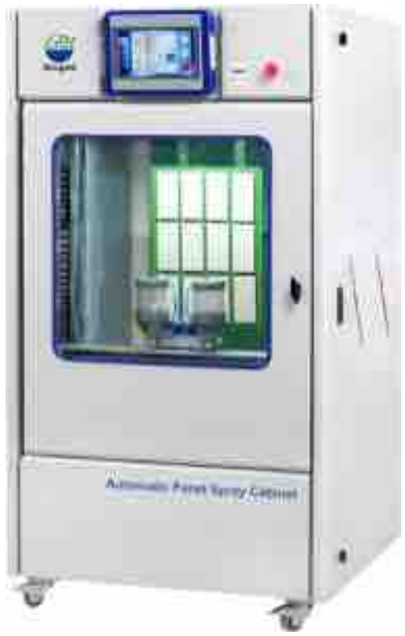
◆ With 10-inch touch screen, powerful visual operation.

◆ User can edit and save several spraying programs in machine, and user also can preset the intelligent spraying programs in machine, which will help the operators who are not familiar with spraying operation to complete spraying with one key;

◆ The machine applied servo control system, user can apply horizontal, vertical or cross spraying methods, and can set the spraying area freely, which will reduce the waste and save spraying time, and double the efficiency!

◆ The sample grid stand is very easy to be disassembled, it's convenient for users to replace samples of different materials, shorten the spraying time.

Main Technical Parameters：
★ Max. Spraying Area: 12 pcs panels with 150 mm × 75 mm （single spray gun）or total 315 mm × 460 mm （double spray gun）;
★ Gun Moving Speed: 0–1,000mm/s in horizontal direction and 0–200mm/s in vertical direction;
★ Spraying Distance: 100mm–300mm （can be adjusted automatically）
★ System Pressure: 0–0.7MPa
★ Atomization Pressure: 0–0.7MPa
★ Overall Size: 950mm × 800mm × 1800mm (LXWXH)
★ Power Supply: 220V; 50/60HZ
★ Total Power: 1.5KW
★ **Ordering Information:** BGD 227–––Automatic Panel Spray Cabinet



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 monito-red 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:

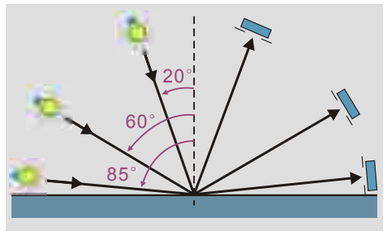
-20° for high gloss surface
-60° for medium gloss surface
-85° for low gloss or matt surface

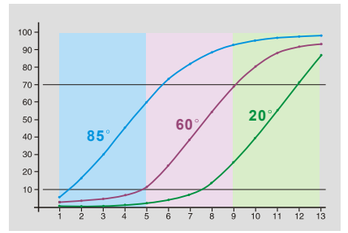
The 60° geometry is widely used due To its medium gloss coverage. However, it has been experimentally shown that when reading taken at 60° exceed 70 GU, then a change to 20° is recommended for better differentiation. Equally when reading drops below 10 GU the geometry should be changed to 85° for the 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 Economic 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
- 3.5 inch color screen, high resolution（4 8 0 × 3 2 0）, full-view
- Chinese and English for selection
- Show 5 groups of testing results Simultaneously, convenient to compare
- For BGD 515/S, three angle（20° /60° /85° ）can test simultaneously
- Data storage function, max. is 1,000 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/RS 232 interface, can select mini-printer to print testing data
- Auto power-off
- BGD 518/S Curve Glossmeter is specially used for curve or small area samples

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

② Basic Glossmeter (60°)

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

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

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

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

Features

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

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

③ Intelligent Glossmeter

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

- Conforms to the standards: ISO 2813, ISO 7668, ASTM D 523, ASTM D 2457, ASTM C 584, DIN 67530, BS 3900 D5, GB/T 9754, GB/T 9966, GB/T13891,etc
- Starting-up self-diagnosis: It can promptly detect problems such as system errors, the abnormal surface state of a calibrating standard and an improper operation, etc., and give a prompting message. It also allows user to modify the calibrating standard value which is traceable to complete the periodic calibration.
- Specially designed scroll wheel is easy to use, let the user enter different operation menu quickly.
- Menu options presetting: Angle mode, standby time, the size of measuring group, etc.
- Memory: Up to 10,000 measured data or 999 groups of data can be stored.
- For dual-glossmeter and tri-glossmeter, multi angle measurements can be done and displayed at the same time with just one-key operation.
- Parameters can be displayed directly, such as the current measurement frequency, the current values measured and the averages of the group respectively.
- Eight languages including Chinese, English, German, French, Italian, Spanish, Portuguese and Russian can be selected as the display language.
- The meter can not only measure the gloss value, but also measure the haze equivalent to ASTM D 4039 (suitable for dual-glossmeter and tri-glossmeter).
- Instant deletion of invalid measurement: Press and hold on the measuring key (for about 2 seconds) to delete the last measurement data, invalid data usually due to mis-operation in the current measurement group.
- Prompts for operation: The meter is provided with functions such as prompt for storage full, self-diagnosis error and low battery. With the cable accessory, the meter can be connected to a computer conveniently.
- Bluetooth connection is provided for easy connection between the meter and a computer or the mobile device, not only

extending functions, but also implementing intelligent measurement operation and production automation.

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

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

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

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

◆ Come with calibration certificate.

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

Software (Windows version)

Bluetooth connection

Menu wheel operation key:
easy to use

Multi angle measurements can
be done with one-key operation

USB connection:
upload data conveniently

④ Multifunction Glossmeter（New）

BGD 514 Multifunction Glossmeter is developed for foreign market . It has many characteristics such as precise measurement, powerful function, stable performance, easy operation etc**.**

Features：

◆ Conform Standards：ISO 2813、ISO 7668、ASTM D 523、ASTM D 2457、DIN 67 530、JIS Z 8741、BS 3900、BS 6161 、GB/T 9754、GB/T 9966、GB/T13891etc.

◆ Calibration Automatically：When turn on the glossmeter, it will measure standard board automatically and finish calibration.

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

◆ Intelligent USB Interface： Use standard Mini-USB, no need to install any software. Measurement data is stored automatically with Excel format , and also can be transferred to computer or mobile phone at any time. Easy to use and very convenient.

◆ With data storage and querying functions：Super capacity for data storage space, can store one million groups data, and can store for decade.

◆ Multifunction：Can set any measuring times for one sample and calculate its average value, set auto shut-off time, buzzer etc.

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

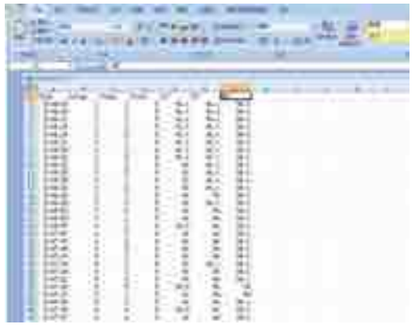
◆ Many measuring angle modes for choose：Single angle measuring mode（20° or 60° or 85° ）and multi angle measuring mode（20° & 60° or 60° & 85° or 20° 、60 ° 、85° ° ）；

◆ Ultra-low power consumption：One AA alkaline battery can measure continuously for more than 20,000 times.

◆ Come with calibration certificate.

◆ After service：One year warranty and lifelong maintenance.

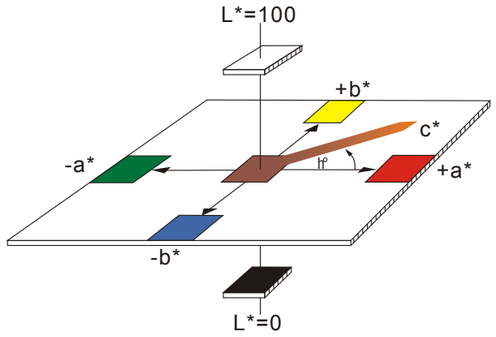
Main Technical Parameters：
★ Measuring Range：0～199.9～2,000GU
★ Accuracy：≤±1.2GU
★ Zero Error：≤ 0.1 GU
★ Stability：≤0.2 GU/30min
★ Annual Variation of standard board：≤±0.5 GU
★ Measuring Area：20°：8.5mm×10mm；60°：16mm×10mm ；
85 °：35mm×5mm
★ Power Supply：One 1.5V aa alkaline battery
★ Dimension：155mm×48mm×85 mm（including holder, L×W×H）
★ Weight：350g
★ **Ordering Information:**
BGD 514 /1–––Multifunction Glossmeter（60° ）
BGD 514 /3–––Multifunction Tri–Glossmeter（20° /60° /85° ）



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.



① Economic Portable Colorimeter

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

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

Feature and Advantages

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

Illuminating Locating

Cross Locating,
Large Stable End Face

Small Concave–Convex End Face

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

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

② Precise Computer Colorimeter

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

◆ **Leading Humanity Design and Convenient Operation**

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

◆ **Stable Measurement Performance**

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

◆ **Flexible and Accurate Locating**

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

◆ **PC SoftwareRealize More Function Expansion**

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

◆ **Advanced Power Management Design**

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

◆ **More Measurement Modes (Only for BGD 556)**

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

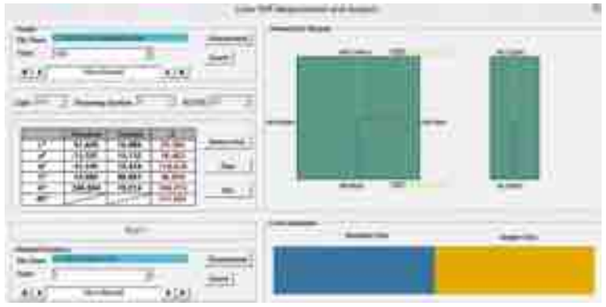
Camera locating
Illumination locating

Built–in White Plate
Automatic Calibration at Startup

Extended Aperture (Optional)
Available for measuring concave surface

Configuring 8mm & 4mm apertures

Ordering Information → Technical Parameters ↓	BGD 555 Precise Computer Colorimeter	BGD 556 Precise Computer Colorimeter
Illuminating/Viewing Geometry	8° /d	
Measuring Aperture	Φ8mm	Φ8mm/Φ4mm
Detector	Silicon photoelectric diode	
Color Space	CIEL*a*b*C*h* ; CIEL*a*b*; CIEXYZ	CIEL*a*b*C*h* ; CIEL*a*b*; CIEXYZ; CIERGB; CIEL*u*v*; CIEL*C*h; Yellowness & Whiteness ; Color Fastness
Color Difference Formula	△E*a b; △L*a*b*; △E*C*h*	△E*a b; △L*a*b*; △E*C*h*; △ECIE94; △E hunter
Light Source	D65	D65; D50; A
Light Source Device	LED blue light excitation	
Errors Between Each Equipment	≤0.40△E*a b	
Storage	100pcs standards; 20000pcs samples	
Repeatability（Average of 30 measurements of standard white plate）	Standard deviation within △E* a b 0.07	Standard deviation within △E* a b 0.06
Language	English/Chinese	
Weight	500g	
Dimension	205×70×100 mm	
Power source	Rechargeable lithium–ion battery 3.7V@3200mAh	
Lamp Life	5 years, more than 1.6 million measurements	
Charging Time	8 hours––100% electricity	
Measuring Times Before Recharging	3000 times in 8 hours	
Operating Environment	–10~40℃, relative humidity 0~85% with no condensation	
PC Software	CQCS3 Software	
Data Interface	USB	
Optional Accessories	BGD 1390––– Special test box for powder BGD 1391––– Universal test components BGD 1392––– Φ8mm extended aperture, available for measuring concave surface BGD 1393––– Mini Printer	



CQCS3 Software

Operation Menu

③ Spectrophotometer

BGD 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.
- ◆ d/8 ° geometrical optics structure, comply with CIE No.15，ISO7724/1, ASTM E1164, DIN5033 standards.
- ◆ Applied combined LED light source with high life and low power consumption.
- ◆ 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.

Main Menu

BGD 1390
Special test box for powder

BGD 1393
Micro Printer

BGD 1395
Universal Test Components

Main Technical Parameters

Ordering Information → Technical Parameters ↓	BGD 558/1 Spectrophotometer	BGD 558/3 Spectrophotometer
Illuminating/Observation System	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	Φ48mm	
Light Source	Combined LED source	Combined LED source; UV Light Source
Spectroscopic Mode	Concave Grating	
Sensor	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）: ϕ8mm/ϕ10mm	Dual Apertures; MAV（Big Aperture）: ϕ8mm/ϕ10mm; SAV（Small Aperture）: ϕ4mm/ϕ5mm
Measurement Mode	SCI & SCE	
Color Space	CIE LAB，XYZ，Y x y，L C h，CIE LUV，Hunter LAB	
Color difference Formula	ΔE^*_{ab}, ΔE^*_{uv}, ΔE^*_{94}, $\Delta E^*_{cmc(2:1)}$, $\Delta E^*_{cmc(1:1)}$, ΔE^*_{00}, ΔE（Hunter）	
Other Chromaticity Data	WI: ASTM E313，CIE/ISO, AATCC, Hunter; YI: ASTM D1925，ASTM 313; TI: ASTM E313，CIE/ISO; 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;	
Measurement Time	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**: 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 0.15 （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	Length × Width × Height=184mm × 77mm × 105mm	
Weight	About 600g	
Battery	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	USB/RS-232, Bluetooth 4.0 Dual Mode（compatible with 2.1）
Data Memory	1000 Standards，20000 Samples（A data can include both SCI and SCE）	1000 Standards，28000 Samples（A data can include both SCI and SCE）
Language	Simplified Chinese，English	
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	Data line、4 pcs No.5 alkaline batteries、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	

Whiteness

① 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 isö150 mm, with two test hole diameter, ϕ 30mm and ϕ 19mm, 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:

GB/T 23774 《Inorganic chemicals for industrial use-General method for the determination of whiteness》

GB/T 5950《Method for measurement of whiteness of building materials and non-metal mineral products》

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》

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≥ ϕ 30mm，thickness≤40mm
★ Power Supply： 220V ± 10%，50Hz，0.3A
★ Working Condition： temperature 0–40 ℃, relative humidity ＜85%
★ Overall Dimension （L × W × H）, mm： 365 × 260 × 425
★ Net Weight： About 11kg
★ **Ordering Information:** BGD 584–––Multi–function Whiteness Meter

② Portable Whiteness Meter

BGD 586 Portable Whiteness Meter has been developed by our company recently. It is designed with the demand of CIE, including standard light resource and light environment. And it complies with GB2913，GB5950，GB8940.1，GB12097，GB13025.2 etc standards. It is used widely in the fields such as textile printing and dyeing, paint and coating, chemical materials, paper and cardboard, plastic, white cement, ceramic, enamelware, porcelain clay, French white , amylum etc.

Features：

- ◆ Can be put in pocket because of microminiature size, portable and is convenient for testing fieldwork.
- ◆ With the newest repairing light resource system, and can measure the fluorescence whiteness
- ◆ Simple operation and no need to zero calibration
- ◆ Saving electrical power, it only needs one buttery and can works excess of fifty hours continuously（can measure ten thousands data）.
- ◆ Special technical design about moisture protection can ensure you use it in various harsh environments.
- ◆ Long lifetime light source.
- ◆ Pass the standard value through the calibrated white board.
- ◆ Can select the case which put the powder sample in specially and pressing sample apparatus.

Main Technical Parameters：
★ Incidence Angle：45/0
★ Range of Measurement：0–99.9
★ Whiteness Formula：The Whiteness of Blue Light
★ Light Source：D65
★ Repeatability：0.2
★ Power Supply：1.5V AA
★ Weight：300g
★ **Ordering Information**：
BGD 586–––Portable Whiteness Meter

THICKNESS

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

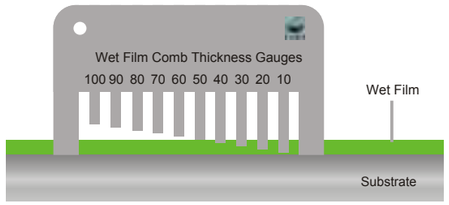
② Wet Film Comb Thickness Gauges

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 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.

◆ **Ordering Information：**

BGD 531/1	10–100μm （@10μm）
BGD 531/2	20–200μm （@20μm）
BGD 531/3	50–750μm （@25μm/@50μm）
BGD 531/4	250–700μm （@50μm）
BGD 531/5	50–950μm （@50μm）
BGD 531/6	300–2,600μm （Quadrilateral @25μm/100μm）
BGD 531/7	25–3,000μm （Hexagon）



③ Rolling Wheel Wet Film Thickness Gauges

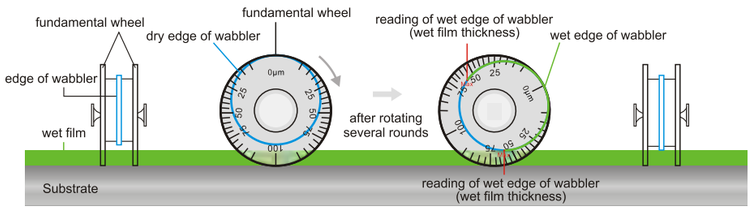
The Rolling Wheel Wet Film Thickness Gauge has long been the standard for measuring wet film thickness in the coatings industry.（U.S.Patent No.3, 128,558）.

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 2.5μm（±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	0–100μm （@5μm）
BGD 532/2	0–200μm （@10μm）
BGD 532/3	0–500μm （@25μm）
BGD 532/4	0–1,000μm （@50μm）



④ Precise Dry Film Thickness Gauge

Using magnetic induction or Eddy current, this electronic gauge offers precision thickness measurement of non magnetic coatings such as paints, zinc etc. on steel（F: ferrous probe）, and insulating materials on non-ferrous substrates（FN: non-ferrous.）. The gauge is available with either integral or external F, N or dual FN probes. The FN probe features automatic substrate recognition to simplify operation.

Biuged offer many different types of thickness Gauges to meet with different clients' request under different conditions.

BGD 542 One-body

BGD 543 Separate probe

Ordering Information → / Technical Parameters ↓		BGD 542/1	BGD 542/2	BGD 543/1	BGD 543/2
Type		In built probes		With separate probes	
Operating principle		Only F	F&NF	Only F	F&NF
Measuring range		0-1250μm/0-50mil（Also can ask for larger range）			
Resolution		0.1/1			
Accuracy		±1-3% or ±2.5μm			
Min. radius work piece		F：Convex 1.5mm/Concave 25mm； N： Convex 3mm/Concave 50mm			
Min. measuring area		6mm²			
Min. sample thickness		0.3mm			
Metric/ imperial		Convertible			
Power supply		4×1.5V AA Battery			
Battery indicator		Low battery indicator			
Operating conditions		0-40℃；10-90%RH			
Dimension		126×65×27mm			
Weight		81g			
Standard delivery	Main unit	√	√	√	√
	F type probe	√	√	√	√
	N type probe		√		√
	F calibration base set	√	√	√	√
	N calibration base set		√		√
	Calibration foil set	√	√	√	√
	Carrying case	√	√	√	√
	Instruction manual	√	√	√	√
Optional Accessories		USB cable，Software，Adapter for blue toot			

⑤ 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 D 4138,AS 1580 Meth 408.1

Main Technical Parameters：
★ Measuring range (standard)： 2～2,800μm
★ Power supply： 1 pc 1.5V battery
★ Overall Size： 110×85×25mm
★ Weight： 0.5 KG
★ **Ordering Information:**
BGD 548––– Paint Inspection Gauge
BGD 548/1P––– No.1 Cutter（20–2,800μm）
BGD 548/2P––– No.2 Cutter（10–1,400μm）
BGD 548/3P––– No.3 Cutter（5–700μm）
BGD 548/4P––– No.4 Cutter（2–280μm）

Mearsuing Theory

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 ASTM Method D 1653

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 557 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	

Insulation Resistance Meter

Insulation resistance Meter is used to test electrician insulated materials, cable and wire, Anti-static engineering and other electric materials. It is made up of the most advanced high megohm resistance, weak current electronic components. With high precision, high resolution, strong capacity anti jamming etc characters.

Main Technical Parameters：
★ Rated voltage： 10V； 100V； 500V
★ Measuring Scope： 0–2×10^{12}Ω
★ Measurement error：
±（1% showing value+2 LSD） $R_x \leqslant 10^9\Omega$
±（3% showing value+2 LSD） $10^{10}\Omega \geqslant R_x \geqslant 10^7\Omega$
±（5% showing value+2 LSD） $10^{12}\Omega \geqslant R_x \geqslant 10^{10}\Omega$
±（10% showing value+2LSD） $10^{14}\Omega \leqslant R_x > 10^{12}\Omega$
±（20% showing value+10 LSD） $> 10^{14}\Omega$
★ Testing set time： 1min～7min
★ Power supply： 8 pcs 1.2V(rechargeable batteries) or 8 pcs 1.5V battery
★ Operating environment： 0～40℃ 85%RH（25℃）
★ Weight： 2kg
★ Size： 270mm×250mm×100mm
★ **Ordering Information**： BGD 968––– Insulation Resistance Meter

Film Mechanical Performance

ADHESION

① Cross Hatch Adhesion 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.

The Cross Hatch Cutters conform with the requirements of:

BS 3900 E6; BS/EN ISO 2409; ASTM D 3359 D 3302

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

BGD 502

Ordering Information	No. Of Teeth	No. Of Cutting Edges	Cutter Spacing
BGD 502/2A	11	8	1mm
BGD 502/3A	6	8	1mm
BGD 502/4A	11	8	2mm
BGD 502/5A	6	8	2mm
BGD 502/6A	6	8	3mm
BGD 504/2	11	1	1mm
BGD 504/3	6	1	1mm
BGD 504/4	11	1	2mm
BGD 504/5	6	1	2mm
BGD 504/6	6	1	3mm

BGD 504

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.

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 1280---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 3359 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 stroke, cutting distance and cutting number (the number of squares) can be set
- ◆ Preset conventional cutting program, which can complete the cross cut operation with one key
- ◆ 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

Main Technical Parameters：

- ★ Test plate Size: 150mm × 100mm × （0.5-20）mm
- ★ Setting Range of Cutter Load: 5N ~ 30N
- ★ Cutting Speed Setting Range: 1mm/s ~ 20mm/s
- ★ Setting Range of cutting spacing: 1mm ~ 5mm
- ★ Power supply: 220V, 50/60Hz
- ★ Max. Power: 80W
- ★ Gross Weight: 30KG
- ★ Instrument Dimension: 540mm × 335mm × 380mm（L × W × H）
- ★ **Ordering Information:**
  BGD 535---Automatic Cross Hatch Tester

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
★ BGD 1020---610 Type：	Length/66.0m；	Width/19 mm
★ BGD 1021---610 Type：	Length/66.0m；	Width/25.4 mm
★ BGD 1030---810 Type：	Length/32.9m；	Width/19 mm
★ BGD 1040---898 Type：	Length/50.0m；	Width/25 mm

③ 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 D 4541, ASTM D 7234, EN 13144, ISO 4624, ISO 16276 etc.

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
- ◆ Two 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.

Main Technical Parameters：	
★ Dolly Size：	20mm（Standard）；10mm、14mm、50mm（Optional）
★ Resolution：	0.01MPa（1psi）
★ Accuracy：	±1% Full scale
★ Max. Pull-off Pressure：	Φ 10mm dolly →2.8-80MPa； Φ 14mm dolly→1.4-40MPa；
	Φ 20mm dolly→0.7-20MPa； Φ 50mm dolly→0.4-3.5MPa；
★ Pull-off Rate Set Range（for BGD 500/S）：	10mm dolly→0.4-6 MPa/s；
	14mm dolly→0.2-3 MPa/s； 20mm dolly→0.1-1.5 MPa/s； 50mm dolly→0.02-0.24MPa/s；
★ Power：	Built-in rechargeable lithium battery, and standard configuration charging adapter.
★ Tester Size（L × W × H）：	360mm × 75mm × 115mm（BGD 500）
	240mm × 138mm × 81mm（BGD 500/S）
★ Tester Weight：	3KG（BGD 500）; 4KG（BGD 500/S）

★ Ordering Information:

- BGD 500----Digital Pull-off Adhesion Tester
- BGD 500/S----Automatic Digital Pull-off Adhesion Tester
- BGD 1520----10mm Dolly（10 pcs/package）
- BGD 1521----14mm Dolly（10 pcs/package）
- BGD 1522----20mm Dolly（10 pcs/package）
- BGD 1523----50mm Dolly（10 pcs/package）
- BGD 1524----50mm Dolly Base
- BGD 1525----Cutting Tool for 50mm dolly
- BGD 1526----Cutting Tool for 20mm dolly
- BGD 1527----3M Adhesive

★ Packing List：

① Adhesion Tester with digital display
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

Dolly

Cutting Tool

3M Glue

BGD 500

BGD 500/S

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 D 3363, ISO 15184.

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 Tester, Body
② 1 Set of Pencils（12）： -4B-3B-2B-B-HB-H-2H-3H-4H-5H-6H.
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 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 507/S 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, 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, 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 D 3363

Main Technical Parameters：
★ Setting range of Pencil tip Force: 250g-1000g
★ Pencil Moving Distance: 80mm
★ Setting range of Pencil Moving Speed: 0-10mm/s
★ Overall Size（L×W×H）: 430mm×250mm×230mm
★ Ordering Information:
BGD 507/S--- 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 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：500±5g
★ Indentation Diameter：30±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

⑤ 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 is shown 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 the paint appear scratch. Testing result is shown as critical loads.

As a important member of Chinese Paint & Coating Standard Committee , Biuged is responsible for drafting the relative Chinese standards on the base of ISO 1518, and developed BGD 520 scratch testers which conforms the newest ISO 1518:2011.

Characters

- Big working table can be moved left and rightconvenient for measuring different areas in the same panel
- Special fixing device for sample---can test different size substrate
- Sound-light Alarm system for puncturing through sample panel---more visual
- High hardness material stylus--more durable

Main Technical Parameters

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 0.5mm	Coned sapphire or diamond, the tip radius is 0.03mm
Weight	0.5N×2，1N×2，2N×1，5N×1，10N×1	0g～50g or 0g～100g or 0g～200g
Working distance	120mm	100mm
Stylus moving speed	（35±5）mm/s	（10±2）mm/s
Angle between stylus and sample	90°	
Motor	60W 220V 50Hz	
Max. panel size	200×100mm	
Max. panel thickness	Less than 1mm	Less than 12mm
Dimensions	560×270×380mm (L×W×H)	58×270×300mm (L×W×H)
Net weight	17 KG	17.5 KG

Optional Accessories

BGD 1003---Scratch stylus A, having a hemispherical hard–metal tip of radius (0,50 ± 0,01) mm.
BGD 1004---Scratch stylus B, having a hemispherical hard–metal tip of radius (0,25 ± 0,01) mm.
BGD 1005---Scratch stylus C, having a hemispherical synthetic–ruby tip of radius (0,50 ± 0,01) mm.
BGD 1006---Scratch stylus D, having a hemispherical synthetic–ruby tip of radius (0,25 ± 0,01) mm.
BGD 1007---Stylus for BGD 520/2

BGD 520/1

BGD 520/2

⑥ 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 D 2197and ASTM D 5178. It can offer from 100g to 5,000g 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：60W
★ Weights：1×100 g, 2×200 g, 1×500 g, 2×1000 g, 1×2000 g
★ Loop–shaped Stylus：Made of chromium–plated steel and shall be in the form of a rod of 1,6 mm diameter bent into a “U” shape with an outside radius of（3.25±0.05）mm . With smooth surface and hardness is Rockwell HRC56 to HRC58 and its surface shall be smooth(roughness ≤0.05 μ m).
★ Stylus moving speed：0 mm/s～10 mm/s（step: 0.5mm/s）
★ Angle between stylus with test panels：45°
★ Test panels Size：Less than 200mm×100mm（L×W）, Thickness is less than 10mm
★ Power：220V AC 50/60Hz Weight：15kg
★ Overall Size：540×250×375mm（L×W×H）
★ **Ordering information:**
BGD 536---Mar Resistance Tester
BGD 1008---Loop–shaped stylus

⑦ 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°.）

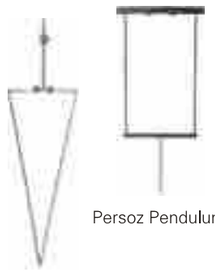
The instruments embody the same principle that the amplitude of oscillation of a pendulum touching a surface decreases more rapidly the softer the surface but differ in respect of dimensions, period and amplitude of oscillation.

BGD 509 Pendulum Hardness Tester is the newest product which can be used in accordance with the following National and International Standards: ISO 1522 which supersedes 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

- Automatic counter range: 0~999 times
- High precision machined pendulums are good stable, ensure a repeatable and comparable testing result.
- Can change two test procedure: König or Persoz test
- Suitable to different thickness substrates from 0.3mm~6.0mm
- Humanistic LCD Operator Interface
- Release Pendulum with shutter release, can get more accuracy test result.
- Lifting platform designed specially can fix specimen easily, platform can keep stable and no shake when pendulum is oscillating.
- Spirit levels produced specially have high precision, convenient customer to adjust level precisely.
- Can record automatically the time or times for the amplitude of swing to decrease from one angle to other angle and stop testing automatically.
- Record the data with two light sensitive sensors
- Can select record mode freely: Timing mode or counting mode.
- Perspex cover reduces the effects of air flow on final results.
- Come with Calibration Certificate.



Persoz Pendulum

König Pendulum

Main Technical Parameters

Ordering Information → Technical Item ↓	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	485mm × 400mm × 770mm（L × W × H）		
Net Weigh	21.5 KG		

⑧ 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: DIN53505, ASTMD2240, ISO7619, JISK7215

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: 162x65x38mm
★ 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

⑨ Hardness Test Pencil

This instrument has been designed for the measurement of the hardness of protective coatings. The degree of hardness of paint films, plastic coatings, etc. can be accurately measured and recorded with the **Hardness Test Pencil.** No matter whether on a level or curved surface, small or large. The instrument is always ready for use and, because of it's small size easy transportable, an asset which will be appreciated by all concerned with hardness tests.

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 10 mm long line at a rate of approximately 10 mm/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 Newtons.

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

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

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

★ **Ordering information:**
BGD 511–––Hardness Test Pencil
BGD 1071–––No.1 Test Tip（0.5 mm）
BGD 1072–––No.2 Test Tip（0.75 mm）
BGD 1073–––No.3 Test Tip（1.0 mm）
BGD 1075–––Blue Spring（0–3N）
BGD 1076–––Red Spring（0–10N）
BGD 1077–––Yellow Spring（0–20N）

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 D 522,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 wich 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 120~150mm; 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 D 522,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 ≤75mm; Thickness≤0.8mm
★ Overall dimensions: 300×120×83 mm (L×W×H)
★ Come with Calibration Certification
★ Weight: 7kg
★ **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》 "olding method"

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

IMPACT

① 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

Hammer

BGD 306

BGD 305

Main Technical Parameters

Ordering Information→ Technical parameter ↓	BGD 305 Heavy-Duty Impact Tester	BGD 306 ISO 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.
Instrument scale length	0–100cm（40inch）	
Graduation	1cm	
Falling Weights	1000g（2 pcs）、300g（1 pc）、2 lb（2 pcs）	Main weight with indenter：1000g（1 pc） Additional weight：1000g（1 pc） Additional weight：2000g（1 pc）
Indenter Diameter	Φ12.7mm（1/2 inch）、Φ15.9mm（5/8 inch）	Φ20 mm
Die inside Diameter	Φ16.3mm	Φ27mm
Standards	ASTM D 2794、ISO 6272.2	ISO 6272.1

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 D 2794,JISK 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）： 380×240×800mm
★ Net Weight（includes all weights）： 24KG
★ **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 × 70 mm 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 thickness：12mm
★ Maximum depress power: 2,500N
★ Resolution of dent：0.01mm
★ Counter：digital display, in 0.01mm increments
★ Dimension of test pane：150mm×70mm ×0.03–1.25mm （Smooth, not deformed）
★ Material：polished steel panel
★ Net Weight：28Kg
★ Overall Size：290×240×370mm （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 machines 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, locate accurately and precision can reach ±0.01mm

◆ The max. width of test panel can be 90mm

Main Technical Parameters：
★ Diameter of punch： ϕ20mm（0.8 inch）
★ Maximum dent depth： 18mm
★ Maximum depress power: 2,500N
★ Precision of dent： 0.01mm
★ Suitable thickness of test pane：0.03mm~1.25mm
★ Net Weight: 52Kg
★ Overall Size： 466×322×500mm（L×W×H）
★ **Ordering Information**：
BGD 310---Automatic Digital Cupping Tester

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 D 3450、ASTM D 4213、ASTM D 4828、DIN EN 11330、EN. ISO 11998 etc.

Feature:

◆ Running speed can be set to meet requirements of different standards.

◆ With four-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 ： 5～95 times/min（adjustable）
★ Range of count： 9999 times
★ Size of test plate： 430×150×0.03mm
★ Power of motor：25W
★ Power：110V～220V；50/60 Hz
★ Overall size： 590×460×300mm（L×W×H）
★ Net Weight：27 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, no includes peristaltic pump）
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 527---Wet Abrasion Scrub Tester（ASTM D 2486& ISO 11998））

Optional Accessories

BGD 1187--- Abrasion Heads for ASTM D 3450（Sponge+ Weights, total weigh is 1,500g）
BGD 1188--- Abrasion Heads for ASTM D 4213（Sponge+3M Scotch Brite handpads + Weights, total weigh is 470±10g）
BGD 1189--- Abrasion Heads for ASTM D 4828（Sponge+ Weights, total weigh is 1000±10g）
BGD 1191---Abrasion Heads for DIN 53778（Hog Bristle Brush+ Weights, total weigh is 250±10g）
BGD 1195---Abrasion Heads for ISO 11998（3M Scotch Brite handpads + Weights, total weigh is 135±1g）
BGD 1196---Abrasion Heads for ASMT D 2486®（Nylon+ Weights, total weigh is 454±10g）
BGD 1197---Special Brush Carrier for Sponges Abrasion Heads
BGD 1045 ---Abrasive pad（3M Scotch Brite handpads）（ISO 11998；Size--- 90×39mm；Pack of 50 pairs）
BGD 1364---Special nylon brush （ASTM D 2486；1 pair）
BGD 1365/A---Hog Bristle Brush（1 pair）
BGD 1510---Sponges (ASTM D 3450;12 pcs)
BGD 1511---Sponges (ASTM D 4213 & ASTM 4828；12 pcs)
BGD 2355---Brass Shim （165×12.7×0.25mm；pack of 10 pairs）
BGD 2208---Black plastic panel（432×165×0.25mm；pack of 100 pcs）
Note：If choose BGD 1187, BGD 1188 and BGD 1189, then BGD 1197 is necessary.

Nylon brush of ASTM 2486

ISO 11998 Special brush

Sponges of ASTM D 3450、ASTM D 4213 、ASTM D 4828

Black plastic panel

② Multifunction Abrasion Scrub Tester

BGD 528 Multifunction Abrasion Scrub Tester is a powerful abrasion tester. By changing different abrasion heads, it can conform all testing standards for linear reciprocating abrasion, including wet abrasion scrub, sponge washability, scrub resistance, cleanability, dirt pickup resistance, MEK test, Rub test etc.

Moreover, this machine use touch screen to operate, user can set all required test parameters directly through touch screen, and also can check its working status at any time. Very easy and convenient to operate it.

It accords with standards such as ISO 11998、ASTM D 2486、ASTM D 3450、ASTM D 4213、ASTM D 4828、ASTM D 4752、DIN En13300、etc.

Features:

◆ With double working channels, each channel is equipped with a separate container for scrub medium . Operator can use two different type mediums to do two different tests, also can do wet abrasion and dry abrasion test at the same time.

◆ Working speed can be set from 5-95 times/minutes freely；Working distance can be set from 0-300mm freely, meet with different standards.

◆ Push-rod design for reciprocating motion, thus working speed is more stable and more even and can get more reliable test results.

◆ With peristaltic pump, operator can set and control precisely scrub medium flow

◆ Installing and dismantling test panels or replacing different abrasion heads is more convenient and faster.

◆ All machine is made up of aluminum alloy, beautiful and strong, has a longer service time.

◆ Compatible for 110V/220V and 50HZ/60HZ

Main Technical Parameters：
★ Stroke Length：0～300mm（adjustable）
★ Frequency of travel ：5～95 times/min（adjustable）
★ Range of count：0～9,999 times
★ Size of test plate：430×150×0.03mm
★ Power of motor：25W
★ Power：110V～220V；50/60 Hz
★ Overall size：500×460×280mm （L×W×H）
★ Capacity of Water Container：500ml×2

Two brush holders for side by side testing

Distance Adjustment Handle

Water Container + Shelf

Black plastic panel

Consumables：

BGD 1045 ---Abrasive pad（3M Scotch Brite handpads）
（ISO 11998；Size--- 90×39mm; Pack of 50）
BGD 1364---Special nylon brush （ASTM D 2486；1 pair）
BGD 1365/A---Hog Bristle Brush（1 pair）
BGD 1510---Sponges (ASTM D 3450;12 pcs)
BGD 1511---Sponges (ASTM D 4213 & ASTM 4828 ;12 pcs)
BGD 2355---Brass Shim （432×12.7×0.25mm；12 pairs/box）
BGD 2208---Black plastic panel（432×165×0.25mm；pack of 100）

Ordering Information:

BGD 528--- Multifunction Abrasion Scrub Tester
BGD 1179---Abrasion Heads for DIN 53778（Hog Bristle Brush+ Weights, total weigh is 250±10g）
BGD 1182---Abrasion Heads for ASTM D 4752（Cheesecloth pad+weights, total weight is 1000±10g）
BGD 1184--- Abrasion Heads for Rub Resistance（For printed materials，Offset paper+weights，total weight is 20N±0.2N）
BGD 1185---Abrasion Heads for ISO 11998（3M Scotch Brite handpads + Weights, total weight is 135±1g）
BGD 1186---Abrasion Heads for ASMT D 2486（Nylon+ Weights, total weight is 454±10g）
BGD 1187--- Abrasion Heads for ASTM D 3450（Sponge+ Weights, total weight is 1,500g）
BGD 1188--- Abrasion Heads for ASTM D 4213（Sponge+3M Scotch Brite handpads + Weights, total weight is 470±10g）
BGD 1189--- Abrasion Heads for ASTM D 4828（Sponge+ Weights, total weight is 1000±10g）
BGD 1190/A--- Abrasion Heads for Alcohol Resistance（1cm² area，25g/50g/100g/200g/500g weights+Cotton gauze）
BGD 1190/R--- Abrasion Heads for Rubber Resistance（25g/50g/100g/200g/500g weights+5 rubbers）

③ Solvent Rub Resistance Tester

BGD 521 Solvent Rub Resistance Tester is designed according to ASTM D 4752 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 breakthrough 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.

◆ Wide voltage range design（110-220V；50/60Hz）, good compatibility
◆ Adjustable variable speed：5~95 c.p.m
◆ Micro-computer control, LCD displays data and set parameters.
◆ Parameters set freely and permanently storage.
◆ Glass work platform is easy to clean

Main Technical Parameters：
★ Motor Power：60W 220V 50Hz
★ Rubbing weight：1000±10 g
★ Rubbing speed：5–95/min（stepless speed regulation）
★ Rubbing head diameter：14±0.5 mm（area is 1.5cm²）
★ Rubbing Distance：120mm （also can be customized）
（selectable, and we also can offer special rubbing distance）
★ Rubbing times：0~9,999
★ Overall Size：270×310×340mm （L×W×H）
★ Net Weight：15Kg
★ **Ordering Information:**
BGD 521--- Solvent Rub Resistance Tester

④ Rotational Abrasion Tester

BGD 523 Rotational 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.

The principle of abrasion derived by the test sample, turning on a vertical axis, against the sliding rotation of 2 Abrading Wheels. The wheels are driven by the sample in opposite directions about a horizontal axis displaced tangentially from the axis of the sample One of the abrading wheel rubs the specimen outward toward the periphery and the other wheel, inward to the centre. The area of abrasion from a pattern of crossed arcs of about 30sq.cm

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

- ◆ 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.
- ◆ 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 ~ 9,999 times
★ Specimen size requirement： Φ100 × Φ8（center hole）×3mm
Thickness：BGD 522→20mm ~ 25mm；BGD 523→0 ~ 5mm
★ Dimension of abrasive sheet： Φ50 × Φ16（center hole）×13mm
★ Load weight：500g–750g–1000g
★ Main motor power：25W 220V 50Hz
★ Overall Size：260 × 410 × 280mm（L×W×H）
★ Net Weight：20KG
★ **Ordering Information:**
BGD 522–––Rotational Abrasion Tester （for wood）
BGD 523–––Rotational 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）
CS–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 1368–––180 # Emery cloth stripe （pack of 100）
BGD 1372––– Fixing ring for soft specimen.
BGD 2601–––Glass Panel with circular hole（pack of 100）
BGD 2328–––Aluminum Panel with circular hole（pack of 100）

CS–10
Standard abrasive rubber wheel

CS–17
Standard abrasive rubber wheel

S–11
Resurfacing medium disc

⑤ Falling Sand Abrasion Testers

BGD 529 Falling Sand Abrasion Tester is is designed according to ASTM D 968. 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 swithch is more convenient to operate
- ◆ The distance between guide tube and specimen holder is calibrated by special tool which comes Which 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 1370––– Standard Sand (25kg/package)

⑥ 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：	
★ Size：800（L）×300（W）×380（H）mm	
★ Weight：20KG	
★ Power：50HZ/220V	
★ Packing List：	
① Paper Roll （2）	② 1/4" Roll of Paper （1）
③ Wrench Set （1）	④ Universal Vise （1）
⑤ Extra O–Rings （5）	⑥ Dust Cover （1）
⑦ Handy Mag （1）	⑧ Surface Gage & Indicator Set （1）
⑨ Weights（55g,175g, 275g）	
★ **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 Microcomputer Table Electronic Tensile Machine

Introduction: This is a Table Electronic Tensile Machine attached with the micro printer, it can not only can test the tensile strength, compressive strength and extension length of all kinds of material, semi finished products and products, but also do the experience of stripping, tearing, bending, flexural, compression etc. Therefore, it is widely applied in the field of metal, plastic, rubber, textile, synthetic chemicals, wire and cable, leather etc

Main Technical Parameters：
★ Max. Capacity (Optional): 50N、100N、200N、500N、1000N、2000N
★ Precision Grade: Grade 1
★ Measuring Range of Test Force: 1% ~ 100% FS (Full Range)
★ The Indicated Error of Test Force: ≤ ± 1%
★ The Resolution of Test Force: ± 1/250000 of Max. Force (There is no grade in the whole process, and keep the constant resolution throughout the whole process.)
★ The Error of Indicated Displacement: ≤ ± 0.2% (Indicating Value)
★ The Resolution of Displacement: 0.015mm
★ The Valid Width of Test: 120mm
★ The Range of Tensile Speed: 100 ~ 500 mm/min (Adjustable)
★ The Valid Length of Tensile (Excluding Clamp Holder): 1100mm (Excluding Clamp Holder)
★ External Dimensions: 570mm × 410mm × 1800mm
★ Weight: 70 Kg
★ Power Supply: 220V/50Hz
★ Power: 400 W
★ Ordering Information:
BGD 575---Microcomputer Table Electronic Tensile Machine
BGD 1551---Tensile small range sensor (≤500KG)
BGD 1552---Tensile big range senso (≥ 500KG)
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

② 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: ASTM D 903、GB/T 16491、GB/T 1040、GB/T 8808、GB 13022、GB/T 2790 etc.

◆ 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 calculation of 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 open-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

Main Technical Parameters

Product → 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）	450×550×1350mm	600×420×1250mm
Weight	100kg	150 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---Elongation Device（Also call big deformation device, measurebreaking elongation，only available BGD 574，see NOTE)
BGD 1551---Tensile small range sensor（≤ 500KG）
BGD 1552---Tensile big range senso（≥ 500KG）
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

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.

③ 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 527, ISO 604, ISO 178, ISO 1209, ASTM D 638, ASTM D 903
◆ 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.
◆ ser 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 open-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 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---Elongation Device（Also call big deformation device, measure breaking elongation，only available BGD 574，see NOTE)

BGD 1551---Tensile small range sensor (≤500KG)）

BGD 1552---Tensile big range senso (≥500KG)）

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 1:50000, namely 0.001~500mm/min（precision : 0.1%）, and can be tested under the whole range.

Main Technical Parameters

Product → 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	0.01–4000mm/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	300kg	380 KG
Power	0.4KW	1.0KW

Special Instruments For Ink and Printing

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 D 4040-10 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： 140×140×300mm　　Package Weight： 18kg
★ 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: ± 0.3mm 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: 750 x300x480mm　　Net weight: 130 KG
★ **Ordering Information:** BGD 615––– Intelligent Inkometer

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

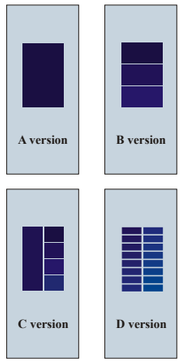
Ordering Information → Parameter ↓	BGD 622/1	BGD 622/2
Applicable for	Gravure Ink	Flexographic Ink
Motor Power	120W	120W
Impression roller	ϕ76×130mm	ϕ50×130mm
Roller Hardness	Shore A 55	Shore A 50
Printing Speed	Four sorts： 20–30–40–45m/min	Four sorts： 20–30–40–45m/min
Printing Length	150mm	150mm
Power	220V 50Hz	220V 50Hz
Overall Size	500×425×350mm	500×425×350mm
Wight	26kg	27kg

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



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:**

BGD 220/1——120 Line Hand Proofer	BGD 220/2——160 Line Hand Proofer
BGD 220/3——180 Line Hand Proofer	BGD 220/4——200 Line Hand Proofer
BGD 220/5——250 Line Hand Proofer	BGD 220/6——300 Line Hand Proofer
BGD 1380——Metal Anilox roller	BGD 1381——Rubber roller

Line Screen Per Inch （LPI）	Line Screen Per Centimeter （LPC）	Volume BCM/in^2	Volume cm^2/m^2
120	47.24	12.79	19.823
160	62.99	9.32	14.446
180	70.87	8.24	12.767
200	78.74	7.28	11.292
250	98.43	5.45	8.454
300	118.11	4.44	6.889

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

Multi-section Ink Printing Proofer

BGD 626 Multi-section Ink Proofing Press 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 requirments.
- ◆ 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, simpe 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：525×430×280mm
- ★ Weight：75KG
- ★ **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

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
- ◆ Micro-computer control, LCD displays data.
- ◆ 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 110V~220V 50/60Hz
- ★ Rubbing Pressure：10±0.2 N（abrasive head）；
  10±0.2 N（additional weight）
- ★ Rubbing Speed：（5–95) times/min.(stepless speed regulation)
- ★ Rubber Pads Size： 25mm x 50 mmx 8mm （L x W x H）
- ★ Rubber Pads Hardness： 50Hs～53Hs
- ★ Rubber Medium：80g/m^2 clean offset paper, the width is 50mm
- ★ Rubbing Distance：60mm
  （We also can offer special rubbing distance as 100mm, 120mm and 155mm）
- ★ Settable Rubbing Times： 0~9,999
- ★ Suitable Specimen Size： 300 mm （L） x 60 mm （W）
- ★ Overall Dimension：275×305×340mm （L x W x H）
- ★ Weight：15Kg
- ★ **Ordering Information:** BGD 630———Rub Resistance Tester

BGD 632 Precise Rub Resistance Tester is designed and manufactured according to ASTM D 5264 and TAPPI T 830. It is applicable in abrasion resistance test of printed materials like labels, folding cartons, corrugated boxes, inserts, circulars, and other packaging materials having applied graphics on a flat substrate. It can help users to analyze the affairs of lower abrasion assistance, ink layer falling-off, lower printable of PS boards, and rigidity of coating layers of other products.

Features:

- Applicable in dry or wet rubbing or scuffing, wet bleed, transfer, wet smear and functional tests.
- Arc moving model, double testing station, high efficiency
- Manifold speeds, convenient and flexible.
- Micro computer controls, film front control panel
- LCD displays testing data
- Function of memory when power off, buzzer prompts automatically when test is finished.
- 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 test the decrement of coating concentration or decrement of coating thickness.

Main Technical Parameters：
★ Rubbing pressure：8.9N （2lb）,17.8N （4lb）
★ Rubbing speed： 21, 42, 85,106cpm
★ Rubbing motion： to–and–fro arc motion
★ Rubbing times： 0~999,999
★ No. of specimens： 1~2 pieces
★ Dimension： 485 （W）×390 （D）×230 （H）mm
★ Power： AC 220V 50Hz/60Hz
★ Net weight： 40 kg
★ Standards：ASTM D5264 TAPPI T830
★ Configuration Standard： Mainframe, test block 8.9N （2lb）, test block 17.8N （4lb）, Rubbing pad
★ Optional：Non–standard test block
★ **Ordering Information：**
BGD 632–––Precise 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 D 4942.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）： 56×100mm
★ Overall Size：330×150×460mm
★ 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：500×200×220mm（L×W×H）
★ Wheel weight：100g
★ Weight：17kg
★ **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（30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,69 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 shape of ink is Marble.
- On the contrary to this, if surface energy of material is bigger than surface energy ofink,the ink uniformly spread on the surface

★ Ordering Information：

BGD 1146–––Surface Tension Test Pens (5ml)
BGD 1147–––Surface Tension Test Pens (12ml)
BGD 1148–––Surface Tension Test Pens (30ml)
BGD 1149–––Surface Tension Test Pens (Rechargeable 60ml)

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:

- International safety certification: get CE, cTUV us and FCC safety certification issued by German TÜV company
- High-efficiency & Durable: The efficiency of brushless DC motor is as high as 95%, and its service life is more than five years.
- Setting safety circuit: Automatically cut off the circuit in the event of the motor overheating and other exceptional circumstances.
- Overload protection: Motor would automatically stop in case of continuous overload.
- Motor protection: When motor is over load, short circuit or any special situation, the machine will alarm and shut down.
- Anti-spill samples: PLC control system starts up smoothly, prevent samples overflow.
- Closed case: is accordance with international popular DIN/EN60529 standard, high protection gradeIP42, can prevent liquid to splash into the machine and lead to corrosion of the circuits.

BGD 702/704/706

BGD 701/703

Main Technical Parameters

Ordering Information → 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	70W		130W		200W
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	0.5mm–10mm				
Dimension（W×H×D）	83x220x186 mm				
Weight	2.4 kg		2.8 kg		3.2 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				

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/cm²/70psi）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

BGD 728

Parameters → Ordering Information ↓	Power	Max.Torque	Working Speed	Capacity	Structure
BGD 720 Air Pneumatic Mixer	0.1HP	0.64 N.m	0–1100 r/min;	1–10 KG	Floor Mode
BGD 722 Air Pneumatic Mixer	0.25HP	1.56 N.m	0–900 r/min	20–50 KG	Floor Mode
BGD 723 Air Pneumatic Mixer	0.25HP	1.56 N.m	0–900 r/min	20–50 KG	Transportable（With bench）
BGD 725 Air Pneumatic Mixer	0.5HP	4.8 Nm	0–720 r/min	50–200 KG	Transportable（No bench）
BGD 728 Portable Pneumatic Agitator	0.5HP	----	0–700 r/min	10–50 KG	Portable

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 Siemens squirrel-cage motor of frequency control（except BGD 740/1 and BGD 741/1） 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.

◆ Standard confirguration: Two or four (only for 550W&750W) different dispersing baldes, and also can select different size sand-milling blades and stainless steel double jacket container for milling.

◆ Power Supply: 220V 50HZ

◆ BGD 740/1 & BGD 740/2 have lifting lever marked with scale, which are convenient to adjust the height of dispersing blade and the bottom of container.

BGD 740/1~2

BGD 742/2

BGD 740/5

Ordering Information	Motor Power	Speed (r/min)	Lift Distance	Torque	Lift System	Come with dispersing blades size	Overall Size，mm W×D×H（Low～Top）
BGD 740/1	550W	0–7,500	240 mm	1.91N.m	Spring lift by hand	50mm&60mm	475×430×560～800
BGD 740/2	750W	0–6,000	260 mm	2.87N.m	Spring lift by hand	50mm&60mm	475×430×635～895
BGD 740/3	1,100W	0–6,000	320 mm	3.82N.m	Electric	60mm&80mm	675×570×1180
BGD 740/4	1,500W	0–5,000	320 mm	5.73N.m	Electric	80mm&100mm	675×570×1180
BGD 740/5	2,200W	0–4,000	520 mm	7.64N.m	Electric	100mm&120mm	700×720×1300～1510
BGD 741/1	550W	0–7,500	300 mm	1.91N.m	Electric	50mm&60mm	475×430×840～910
BGD 741/2	750W	0–6,000	300 mm	2.87N.m	Electric	50mm&60mm	475×430×840～960
BGD 742/2 (Explosion–proof)	750W	0–3,000	300 mm	2.87N.m	Spring lift by hand	50mm&60mm	530×560×965～980
BGD 742/5 (Explosion–proof)	2,200W	0–3,000	520 mm	7.64N.m	Spring lift by hand	100mm&120mm	640×680×1430～1500

Note: For 550W&750W machines, come with two 50mm (a efficient one and a heavy–duty one each) blades and two 60mm (a efficient one and a heavy–duty one each) dispersing blades

◆ Optional Accessories:

BGD 1408–––Extend Shaft for 50mm Dispersing Blade (For BGD 741)
BGD 1409–––Extend Shaft for 60mm Dispersing Blade (For BGD 741)
BGD 1410–––35 mm Dispersing Blade
BGD 1411/S–––50 mm Efficient Dispersing Blade (For low viscosity sample)
BGD 1411/H–––50 mm Heavy Duty Dispersing Blade (For high viscosity sample)
BGD 1412/S–––60 mm Efficient Dispersing Blade （For low viscosity sample)
BGD 1412/H–––60 mm Heavy Duty Dispersing Blade (For high viscosity sample)
BGD 1413–––80 mm Dispersing Blade
BGD 1414–––100 mm Dispersing Blade
BGD 1415–––120 mm Dispersing Blade
BGD 1416–––150 mm Dispersing Blade
BGD 1417–––200 mm Dispersing Blade
BGD 1450–––0.25 L Dispersing Container
BGD 1451–––0.5 L Dispersing Container
BGD 1452–––1.25 L Dispersing Container
BGD 1453–––3 L Dispersing Container
BGD 1454–––5 L Dispersing Container
BGD 1455–––10 L Dispersing Container
BGD 1456–––20 L Dispersing Container
BGD 1460–––Stand for Explosion–proof box

Note: All containers have doublejacket for cooling water except BGD1450.

Super High Speed Dispersing Machine

Introduction: 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.

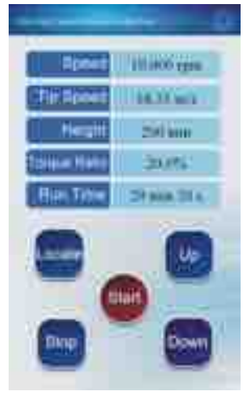
◆ Suitable for containers with the capacity of 0.5L-5L, and can meet more different test requirements.

Main Technical Parameters：
★ Rated Power of Motor: 1.5 KW
★ Rated Motor Torque: 1.6 N.m
★ Adjustable Working Speed: 100rpm～20,000rpm
★ Lift Speed: 0～30mm/s
★ Max. Lift Distance: 300mm
★ Dimension: 450mm×430mm×900mm (L×W×H)
★ Gross Weight: 83 KG
★ Power Supply: 220V, 50/60Hz
★ Max. Power of whole machine: 2 KW
★ Come with two heavy duty dispersing blades: one each of ϕ50mm and ϕ60mm
★ Ordering Information：BGD 746–––Super High Speed Dispersing Machine

NEW

Optional Accessories

BGD 1410–––35 mm Dispersing Blade
BGD 1411/S–––50 mm Efficient Dispersing Blade (For low viscosity sample)
BGD 1412/S–––60 mm Efficient Dispersing Blade （For low viscosity sample)
BGD 1413–––80 mm Dispersing Blade
BGD 1414–––100 mm Dispersing Blade
BGD 1415–––120 mm Dispersing Blade
BGD 1416–––150 mm Dispersing Blade
BGD 1417–––200 mm Dispersing Blade
BGD 1451–––0.5 L Dispersing Container
BGD 1452–––1.25 L Dispersing Container
BGD 1453–––3 L Dispersing Container
BGD 1454–––5 L Dispersing Container



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.

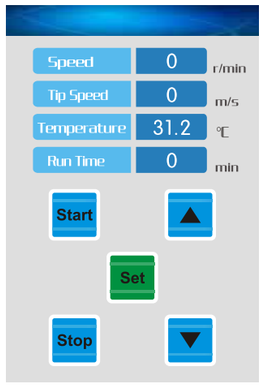
◆ Timing device for dispersing: Operator can set dispersing time, the machine would be stopped automatically when arrive this time

◆ Can choose arc bottom container with double-layer and sand-mill blades for bead mill.

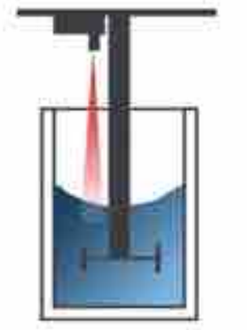
Main Technical Parameters：

- ★ Motor Power：1000W（Brushless DC motor）
- ★ Adjustable working speed：200～6,000r/min
- ★ Lift distance：260mm
- ★ Overall Dimension：450×450×700mm
  （motor is the lowest position）
- ★ Net Weight：40KG
- ★ Come with dispersing blades：Φ50mm and Φ80mm, one each.
- ★ **Ordering Information:**

BGD 745---Multifunction High Speed Dispersing Machine



Operation Menu



Measure Sample Temperature with infrare

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 Siemens squirrel-cage motor of frequency control (except BGD 740/1 and BGD 741/1) 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 baldes, 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 height of dispersing blade and the bottom of container.

BGD 750/1

BGD 750/2

BGD 751/2

(Stand Optional)

BGD 752/2

BGD 750/3

BGD 750/5

Ordering Information	Motor Power	Speed (r/min)	Container Capacity	Lift Distance	Lift System	Dispersing blades	Sand-Mill blades	Overall Size，mm W×D×H（Low～Top）
BGD 750/1	550W	0–7,500	1.25 L	240 mm	Spring lift by hand	50mm&60mm	50mm&60mm	475×430×560～800
BGD 750/2	750W	0–6,000	1.25 L	260 mm	Spring lift by hand	50mm&60mm	50mm&60mm	475×430×635～895
BGD 750/3	1,100W	0–6,000	3 L	320 mm	Electric	60mm&80mm	90mm&100mm	675×570×1180
BGD 750/4	1,500W	0–5,000	3 L	320 mm	Electric	80mm&100mm	90mm&100mm	675×570×1180
BGD 750/5	2,200W	0–4,000	5 L	520 mm	Electric	100mm&120mm	100mm&130mm	700×720×1300～1510
BGD 751/1	550W	0–7,500	1.25 L	300 mm	Electric	50mm&60mm	50mm&60mm	475×430×840～910
BGD 751/2	750W	0–6,000	1.25 L	300 mm	Electric	50mm&60mm	50mm&60mm	475×430×840～960
BGD 752/2 (Explosion–proof)	750W	0–3,000	1.25 L	300 mm	Spring lift by hand	50mm&60mm	50mm&60mm	530×560×965～980
BGD 752/5 (Explosion–proof)	2,200W	0–3,000	5 L	520 mm	Spring lift by hand	100mm&120mm	100mm&130mm	640×680×1430～1500

Note：For 550W&750W machine, come with two 50mm（a efficient one and a heavy–duty one each）blades and two 60mm（a efficient one and a heavy–duty one each）dispersing blades

◆ Optional Accessories:

BGD 1410–––35 mm Dispersing Blade
BGD 1411/S–––50 mm Efficient Dispersing Blade（For low viscosity sample）
BGD 1411/H–––50 mm Heavy Duty Dispersing Blade（For high viscosity sample）
BGD 1412/S–––60 mm Efficient Dispersing Blade（For low viscosity sample）
BGD 1412/H–––60 mm Heavy Duty Dispersing Blade（For high viscosity sample）
BGD 1413–––80 mm Dispersing Blade
BGD 1414–––100 mm Dispersing Blade
BGD 1415–––120 mm Dispersing Blade
BGD 1416–––150 mm Dispersing Blade
BGD 1417–––200 mm Dispersing Blade
BGD 1420–––50mm Sand–milling Blade
BGD 1421–––60mm Sand–milling Blade
BGD 1422–––90mm Sand–milling Blade
BGD 1423–––100mm Sand–milling Blade
BGD 1424–––130mm Sand–milling Blade
BGD 1450–––0.25 L Dispersing Container
BGD 1451–––0.5 L Dispersing Container
BGD 1452–––1.25 L Dispersing Container
BGD 1453–––3 L Dispersing Container
BGD 1454–––5 L Dispersing Container
BGD 1455–––10 L Dispersing Container
BGD 1456–––20 L Dispersing Container
BGD 1460–––Stand for Explosion–proof box

Efficient Dispersing Blade

Heavy Duty Dispersing Blade

Sand–milling Blade

Dispersing Container

Biuged Dispersing Container Size

Ordering Information	BGD 1450	BGD 1451	BGD 1452	BGD 1453	BGD 1454	BGD 1455	BGD 1456
Volume	0.25 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	236mm	253 mm	282 mm	355 mm
Others	Weld bottom/No handle		Arc bottom/ No handle	Weld bottom/With handle			

Lab 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, 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 10ìm shortly.

Main Technical Parameters：
★ Motor Power：750W
★ Working Speed：0–3,00 r.p.m（Adjustable）
★ Lift Distance：3000mm
★ Container Capacity：1.25L / 3L
★ Milling Basket Capacity：160ml/260ml
★ Suitable Added Amount for Mill Medium：180ml
★ Suitable Mill Medium Size（mm）：1.8mm–2.0 mm（suitable weight：340g/400g）
★ Milling Blades Size：Φ52mm/60mm
★ Dispersing Blades Size：Φ60mm/80mm
★ Overall Size：480×430×970 mm; Net Weight：50KG
★ Power Supply：220V 50Hz/60Hz
★ Ordering Information: BGD 756/1–––– Lab Basket Mill (1.25L) BGD 756/2–––– Lab Basket Mill (3L)

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.

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： 750～2200W； 220V 50Hz
★ Rotation speed： 0–2,880 r.p.m
★ Processing Capacity： 0.8–20L
★ 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：
For 550W and 750W–––Spring Lift by hand/ lift platform；
For 1,100W or moreElectric 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 755/5

Lab Horizontal 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 0.8 mm to 1.6 mm. 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 2um -15 um).

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: 1.0 mm ~ 2.0 mm.
★ 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:** BGD757––Lab Horizontal Sand Mill

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： 660 r/min
★ Main shaft reciprocating stroke： 16 mm
★ Upper and lower maximum amplitude： 8 mm
★ Head arm swinging angle： 30°
★ Overall dimension： 790 × 520 × 1090 mm （L × W × H）
★ Weight： 80Kg

Floor 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）

Column Type

Closed Paint Mixer/Shaker

These closed paint mixers and shakers, suitable size continers having sample which is needed to be dispersed or milled are put into, then use the special clamping device to fix containers, set required working time. With high-speed rotating and shaking, sample can be dispersed efficiently and fast. Compared with BGD 760 , these machines have many characteristics of easy and convinent to operate, high-efficiency, no VOC leakage, no pollution etc advantages.

According working principle, these machines can be divided into two types: shaking type and rotating type. For shaking type, the container is shaked up and down, back and forth with high-speed. For rotating type, the container is rotated at revolution and rotation at the same time.

Features:

Manual Type:

- Clamp the container by manual, can select clamping power freely, suitable for any size and type container.
- Safety interlock--- the machine will stop immediately when open its door,prevents the cabinet door from being opened while the machine is running.
- The supporting table for container can be pulled-out, rotated and fixed, save time and power for operator.

Automatic Type:

- Run self-checking program automatically before operation till all parameters are accordace with requirements then begin to work. In case of any abnormality, the machine will alarm by buzzer and indicate need to be set.
- Digital display will show the working stauts and run time, so that the operators can know the machine working status.
- With PLC microcomputer control---Detect and response automatically, adjust height to clamp container.
- Automatic fix or loosen container and offer the suitable working speed.
- Automatically check container size and according it to adjust suitable clamping power and rotating speed.
- Multi-grade intelligent timing inverter, adequate speed control ensures stable operation

BGD 763

BGD 764

Ordering Information → Parameters ↓	BGD 763/1	BGD 763/2	BGD 764/1	BGD 764/2
Working Method	Shaking	Shaking	Rotating	Rotating
Clamping Container Method	Manual	Automatic	Manual	Automatic
Suitable Container Capacity	0.5L–20L			
Suitable Container Height	100mm–380mm		70mm–390mm	
Shaking Frequency	680~710 times/min		----	
Rotating Speed	----		Revolution: 130r/min Rotation: 260r/min	
Motor Power	0.75 KW			
Power Supply	110V or 220v, +–10% adjustable, 50/60HZ			
Net Weight/Gross Weight	195 KG/240KG	210 KG/245KG	200 KG/240KG	187 KG/228KG
Overall Size（H×W×D）	1040×820×710	1040×820×710	1020×820×710	1020×820×710
Optional Accessories	BGD 1900--Special Wood clamp（Sudokus）. Can shake serval different samples simultaneously，it is designed according to customers container size.			

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

Main Technical Parameters

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.

Main Technical Parameters

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

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.

The 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 D 387, ASTM D 332-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； 5 kg；6.4 kg　　Grind Plate Diameter：240mm
★ Digital Displaying Range：0 ~ 9,999
★ Overall dimension：530×360×480 mm（L×W×H）　Weight：80Kg
★ **Ordering Information:** BGD 650---Muller Laboratory Grinder

Homogenizer

BGD 748 Handheld Homogenizer is a high speed dispersing instrument. It is based on the Rotor/Stator Technology. The shaft and rotor/stator can be disassembled for easy cleaning. You will receive the dispersing tools completely assembled for immediate use with your dispenser. This product is for laboratory use only and is used in mainly in biotechnology and human andveterinary medicine and clinical medicine and is suitable among other application for disruption of cells.

The drive unit can be used, based on the dispersing shaft used for volumes from 0.1ml to 50ml with the 5mm shaft or from 1ml to 250ml with the10mm shafts.

Features

- ◆ Ideal for manual operation due to its light weight and ergonomic design
- ◆ Processing range: 0.1-50ml or 1-250ml
- ◆ 316L stainless steel shafts are fully autoclavable and inert for highly corrosive solutions
- ◆ All shafts are interchangeable for easy dismantling and cleaning.
- ◆ 10 modes of motor speed from 8,000 to 30,000 rpm

BGD 1446 Dispersing shaft 5mm

BGD 1447 Dispersing shaft 10mm

Main Technical Parameters：
★ Voltage：220V ~ 240V/50Hz ~ 60Hz or 110V ~ 120V/50Hz ~ 60Hz
★ Motor Type（Universal motor）：160W/AC carbon brush motor
★ Speed Range：8,000 ~ 32,000 r.p.m
★ Max. Circum. Speed：（6.3 ~ 14）m /sec
★ Speed Control Dial knob：10 stage
★ Working Volume：0.1ml ~ 50ml for BGD 748/1；1.0ml ~ 250ml for BGD 748/2
★ Weight：0.54 kg
★ Noise：72 dB(A)
★ Max. Viscosity：5,000mPa.s
★ Material of Dispersing Shaft：SS 316L stainless steel，PTEE
★ Operating Environment：0℃ – 40℃，85% relative humidity
★ Protection Class：IP20
★ Dimensions：45mm x 55mm x 190mm
★ **Ordering Information:**
BGD 748/1---Handheld Homogenizer
（includes a BGD 748 drive, a H Stand and a BGD 1446 dispersing shaft 5mm）
BGD 748/2---Handheld Homogenizer
（includes a BGD 748 drive, a H Stand and a BGD 1447 dispersing shaft 10mm）

Optional Accessories

BGD 1446---Dispersing shaft 5mm，for solid/liquid media and volumes from 0.1–50ml

BGD 1447---Dispersing shaft 10mm，for solid/liquid media and volumes from 1– 250ml

Economic 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 120	120g	0.001g	Φ80mm	√
HZY–A 220	220g	0.001g	Φ80mm	√
HZT–A 100	100g	0.01g	Φ125mm	----
HZT–A 200	200g	0.01g	Φ125mm	----
HZT–A 300	300g	0.01g	Φ125mm	----
HZT–A 500	500g	0.01g	Φ125mm	----
HZT–A 600	600g	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

The BL Precision Balance is an accurate, stable and robust balance which can be supplied with or without a plastic draft guard for higher accuracy of measurements.

The BL Precision Balances are protected against spray and dust according to the IP54 standard.

With the cable accessory, the BL can be connected to a computer for accurate recording of your data.

A range of User programmable metric and imperial measurement units can be displayed.

◆ Ordering Information

Ordering Information → Technical Item ↓	BL-120	BL-200	BL-410	BL-1200	BL-2000	BL-4100
Capacity（g）	120	200	410	1200	2000	4100
Readability（g）	0.001	0.001	0.001	0.01	0.01	0.01
Repeatability（g）	±0.001	±0.001	±0.001	±0.01	±0.01	±0.01
Linearity（g）	±0.002	±0.002	±0.002	±0.02	±0.02	±0.02
Keyboard	Six key	Six key	Six key	Six key	Six key	Six key
Pan Size	ϕ120mm	ϕ120mm	ϕ120mm	ϕ158mm	ϕ158mm	ϕ158mm
Draftshield	Standard	Standard	Standard	N/A	N/A	N/A
Security Lock Kit	Option	Option	Option	Option	Option	Option
Size W*H*D（in）	7*5.75*11	7*5.75*11	7*5.75*11	7*2.5*11	7*2.5*11	7*2.5*11
Interface	Bidirectional RS–232,（standard on all models）					
Display	0.57 " LED（all models）					
Power	7.2VDC（115VAC,60HZ adaptor provided）					

Precise Analytical Balance

- Electric magnetic force balanced principle
- Auto zero-tracking
- Dynamic temperature compensation
- Zero in range ability
- LCD display
- Function of piece counting
- Over-loading warning
- RS232 communication
- Unit conversion（g oz ct kg lb）

◆ Ordering Information

Ordering Information → Technical Item ↓	FA1104	FA1604	FA2004
Weighing Capacity（g）	110	160	200
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

- High-sensitivity electric magnetic force balanced principle for ultra resolution
- Built-in dual-weight balanced calibration technology for ultra accuracy
- Digital multi-point linear calibration, which is convenient for balance calibration
- Internal weight calibration technology, which is convenient for periodical calibration and adjustment without dismantling the balance
- Pillar-free transparent glass draft shields for comfortable operation with enlarge weighting space
- Advanced design with SMT and switch power supply technology, which reduces the dimensions op the rear sensor, and leads to a compact appearance of the balance
- Six-key integrated display panel for easy operation；Big handles for easy movement

◆ Ordering Information

Ordering Information → Technical Item ↓	FB124	FB224	FB223	FB323	FB423
Weighing Capacity（g）	120	220	220	320	420
Readability（mg）	0.1	0.1	1	1	1
Repeatability（≤mg）	±0.1	±0.1	±1	±1	±1
Linearity（≤mg）	±0.2	±0.2	±2	±2	±2
Pan Size（mm）	ϕ90	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
ES-P8K	8 KG	0.1g		
ES-P10K	10 KG	0.1g		
ES-16K	16KG	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
ES-20K	20KG	0.1g		
ES-30K	30KG	0.1g		
ES-60K	60KG	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

Fast Moisture 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.

- With a large capacity of 110grams 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.

Ordering Information→ Technical Item↓	MB23	MB25	MB27
Capacity	110 g		90 g
Repeatablity (Std Dev)	0.3% (3g sample) 0.2% (10g sample)	0.2% (3g sample) 0.05% (10g sample)	0.2% (3 g sample) 0.05% (10 g sample)
Readability	0.1%/0.01g	0.05%/0.005g	0.01%/0.001 g
Sample Size	3g to 20g typical, 0.5g min.		
Interface	Bidirectional RS–232		
Timer	1 – 99 minutes, 30–second increments to 60 minutes		
Heating Technology	Infrared (no glass)		Halogen
Temperature Range	50℃ to 160℃ in 5℃ increments		
Power	100 to 240 VAC, 50/60 Hz		
Tare Range	To capacity by subtraction		
Operating Temp. Range	5℃ to 40℃		
Display Type	Custom backlit LCD		
Displays	% moisture or % solids or weight (g), temperature, time		
Pan Size (Diameter)	90mm		
Dimensions（W×H×D）	17cm×13cm×28cm		17cm×14cm×28cm
Net Weight	2.1 KG		
Shipping Weight	3.9 KG		

MB 25

MB 27

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

★ Ordering Information

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+10–400℃	3250W	50L	350×350×400	890×700×920	2 pcs
BGD 827/2	380V 50HZ	RT+10–500℃	4050W	50L	350×350×400	890×700×920	2 pcs
BGD 828/1	380V 50HZ	RT+10–400℃	4050W	100L	450×450×450	990×790×990	2 pcs
BGD 828/2	380V 50HZ	RT+10–500℃	4900W	100L	450×450×450	990×790×990	2 pcs
BGD 829/1	380V 50HZ	RT+10–400℃	4900W	220L	600×600×600	1140×950×1140	2 pcs
BGD 829/2	380V 50HZ	RT+10–500℃	6050W	220L	600×600×600	1140×950×1140	2 pcs

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.)

Ordering Information → Technical Item ↓	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	220V/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
SX2–6–13	1,300	400×200×160	13L	380V/50HZ	6 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

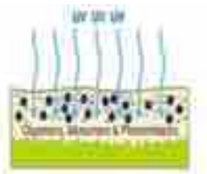
UV Solidify Machine is used widely for UV paint, UV glue, UV inks, UV gloss ink ; It is small, economic and practical as it's selling point, suit for small batches, trial production or used in small enterprise and also is welcomed in painting, glue manufacturers for research and development.

- ◆ 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

Main Technical Parameters:

Ordering Information → Parameters ↓	BGD 8212	BGD 8213	BGD 8313	BGD 8222	BGD 8223	BGD 8323
Power supply	220VAC/50HZ		380VAC/50HZ			
Total power	2.2KW	2.2KW	3.5KW	5.0KW	5.0KW	7.2KW
UV lamp Power	2KW	2KW	3KW	2KW	2KW	3KW
Number of Lamp	1 pc	1 pc	1 pc	2 pcs	2 pcs	2 pcs
speed range	0–10 m/min					
Belt Material	Stainless steel or TEFLON					
Belt Width	200mm	300mm	300mm	200mm	300mm	300mm
Entrance Height	0～100mm					
Cooling System	Air Cooling					
Main Wavelength	365 nm					
Lamp Life	600hours , over 75% intensity					
UV lamp type/Unit power	High–pressure mercury lamp; 100w/m					

We also accept the special custom-made UV Solidify machine order!!



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 250-410 nm, with a pack at the area of 365 nm.

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.

Main Technical Parameters：

- ★ Spectral range： UV 250–410 nm
- ★ Measuring range： 0 to 5,000 mW/cm^2
- ★ Display range： 0 to 999,999 mJ/cm^2
- ★ Power source： 3V Lithium Battery （Replaceable）
- ★ Shape： Disc structure, diameter is 95mm and height is 12mm
- ★ Weight：160g
- ★ Work environment：While on the conveyer belt, it can withstand max.110℃ for up to 10 seconds
- ★ Calibration period: one year
- ★ Ordering information：BGD 140––– UV Integrator

Heating Bath

Heating Bath Provided to colleges, industrial and mining enterprises and scientific research departments for precise constant temperature and auxiliary heating. It is controlled by microprocessor and with timing function.

Main Technical Parameters：

- ★ interior of bath is made of stainless steel with a beautiful and novel appearance.
- ★ Digits display, Microprocessor control with timing function.
- ★ Audible and visible tracking alarm indicates over temperature, which provide samples reliable protection.
- ★ Power Supply： 220V 50HZ
- ★ Temperature Stability： ± 0.5℃
- ★ Temperature Track Alarm： +2℃
- ★ Timing Range： 1～9999min

Ordering Information → Technical Item ↓	Temperature Range	Power	Cubage	interior Dimension （mm） W×D×H	Overall Dimension （mm） W×D×H
BGD 834	RT+5~99 ℃	500W	11L	420×180×150	570×270×260
BGD 835	RT+5~99 ℃	1000W	34L	600×300×190	750×400×300
BGD 836	RT+5~99 ℃	400W	12L	320×240×160	460×280×190
BGD 837	RT+5~99 ℃	600W	22L	450×300×160	610×340×190
BGD 838	RT+5~99 ℃	1000W	30L	600×300×160	760×340× 190

Water/Oil Bath Kettle

Provided to colleges, industrial and mining enterprises and scientific research departments for precise constant temperature and auxiliary heating.

Features

- ◆ interior of bath is made of stainless steel and the center lids can be removable discretionarily.
- ◆ High precision microprocessor temperature controller ensures a precise and reliable temperature control.
- ◆ Audible and visible tracking alarm indicates over–temperature, which provide samples reliable protection.

★ Ordering Information

Ordering Information → Technical Item ↓	Water Bath （with removable center lids）				Oil Bath	
	BGD 830	BGD 831	BGD 832	BGD 833	BGD 839	BGD 840
Electrical Requirements	220V 50HZ				220V 50HZ	
Input Power	500W	1000W	1500W	2000W	1000W	2000W
Temperature Range	From ambient+5 to 99℃				From ambient+5 to 200℃	
Temperature Stability	±0.5℃				±0.5℃	
Tracking Alarm	±0.2℃				±0.2℃	
Chamber Capacity	4.9L	9.9L	14.8L	19.8L	12 L	20 L
Interior Dimension （mm）W×D×H	150×300×110	300×300×110	450×300×110	600×300×110	250×250×200	400×250×200
Timing Range	1~9999min				1~9999min	
Note	Two holes	Double columns four holes	Double columns six holes	Double columns eight holes	---	---

Water Bath

Oil Bath

Low Temperature Thermostatic Bath

THD series Low Temperature Thermostatic Bath is widely used in the fields of biological engineering、medicine、food、chemical industry、chemical analysis、petroleum, etc, providing a constant high precise、controlled、temperature homogeneours place for users. Its temperature is controlled by microprocessor with PID regulator. It has such advantages as fastness in temperature rising and dropping, high precision in controlling temperature.

Vertical

Horizontal

Main Technical Parameters：

Ordering Information → / Technica Item ↓	Range of Temperature (℃)	Fluctuating degree of temperature (℃)	Volume of inner container (mm)	Volume of inner	Szie of opening (mm)	Depeth (mm)	Pump flux (L/min)
THD–05	0 ~ 100	± 0.05	260 × 170 × 120	6 L	150 × 150	120	6
THD–0506	–5 ~ 100	± 0.05	250 × 200 × 150	7.5L	180 × 150	150	6
THD–0515	–5 ~ 100	± 0.05	300 × 250 × 200	15L	235 × 180	200	6
THD–0530	–5 ~ 100	± 0.05	400 × 325 × 230	30L	310 × 280	230	13
THD–1006	–10 ~ 100	± 0.05	250 × 200 × 150	7.5L	180 × 150	150	6
THD–2006	–20 ~ 100	± 0.05	250 × 200 × 150	7.5L	180 × 150	150	6
THD–2015	–20 ~ 100	± 0.05	300 × 250 × 200	15L	235 × 180	200	6
THD–2030	–20 ~ 100	± 0.05	400 × 325 × 230	30L	310 × 280	230	13
THD–3006	–30 ~ 100	± 0.1	250 × 200 × 120	6L	180 × 150	120	6
THD–3010	–30 ~ 100	± 0.1	250 × 200 × 200	10L	180 × 150	200	6
THD–3015	–30 ~ 100	± 0.1	300 × 250 × 200	15L	235 × 180	200	6
THD–3030	–30 ~ 100	± 0.1	400 × 325 × 230	30L	310 × 280	230	13
THD–108W	0 ~ 100	± 0.05	290 × 180 × 150	8 L	155 × 155	150	6
THD–2008W	–21 ~ 100	± 0.05	280 × 250 × 130	9 L	235 × 150	100	6
THD–1008W	–10 ~ 100	± 0.05	290 × 180 × 150	8 L	155 × 155	150	8

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

Ordering Information → Technical Item ↓	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 Test

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 purchase （150mm×70mm standard size）
★ Temperature Range of Working Room：RT~60° （Dry or condensation）
★ Overall Size：1350mm×550mm×1295mm（L×W×H）
★ Weight：130kg
★ Power：220V 50HZ/60HZ；Max. power of machine：2.0KW
★ **Ordering Information:**
BGD 875--- Single-sided Exposure Condensation Chamber

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		Code	Cycle Duration		Conditions in working chamber after reaching equilibrium	
Type			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

◆ A glass observation window is designed in chamber, operator can observe specimens test status directly.

Main Technical Parameters：
★ Test Specimens Capacity：20 purchase （150mm×70mm standard size）
★ Temperature Range of Working Room：RT~60° （Dry or condensation）
★ Overall Size：800mm×750mm×1420mm（L×W×H）
★ Weight：180kg
★ Power：220V 50HZ/60HZ；Max. power of machine：2.0KW
★ **Ordering Information:**
BGD 876 ---In-cabinet Exposure Condensation Chamber

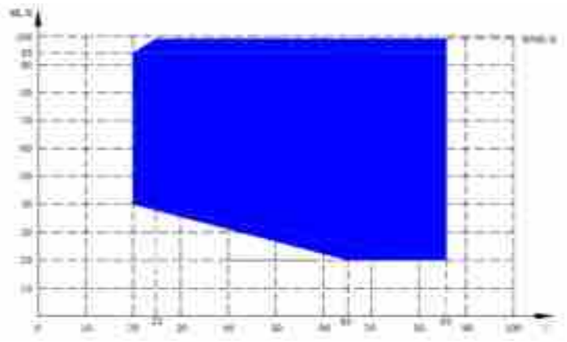
In-cabinet Exposure Condensation Chamber

Operation Menu

High-Low Temperature & Humidity Cabinet (Climate Chmaber)

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.

Main Technical Parameters：
★ Temperature Uniformity：±2 ℃
★ Humidity Uniformity：±2 %RH
★ Temperature Stability：±0.5℃
★ Humidity Stability：≤ 2%～3% Rh (≥ 75%RH) or ≤ ±5% RH (≤75% Rh)
★ Temperature Increasing Rate：≥ 1℃ / 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



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

Ordering Information	Temperature Range	Humidity Range	Total Power/ Max. Current	Working Room Size (W×H×D)	Overall Size (W×H×D)
BGD 897/100B	-20～150℃	20～98%	4.6KW/16A	400×500×500mm	900×1400×1150mm
BGD 897/100C	-40～150℃				
BGD 897/100D	-60～150℃				
BGD 897/225B	-20～150℃		5.5KW/22A	500×750×600mm	1000×1650×1250mm
BGD 897/225C	-40～150℃				
BGD 897/225D	-60～150℃				
BGD 897/408B	-20～150℃		11KW/12A (380V)	800×950×800mm	1300×1850×1400mm

1.0 Structure Feature	
Chamber Structure	Internal material：304# stainless steel with thickness is 1.2mm External material：1.2mm baking finish cold roll steel plate with advanced static electricity spray process. Heat preservation material: polyurethane foam rubber with 100 mm thick Others：install the positioning foot cup and movable trundles under the test chamber bottom; top of chamber equips automatic pressure relief hole, bottom of inner chamber equips drainage hole, can
Air Adjustment Channel	Inside air space, recirculating wind channel and stainless steel cycle fan, through the top window and air diffuser, the wind will out uniformly from the top, let the reconciled temperature from the harmonic room diffuses to the test area, which could reach the purpose of control temperature uniformly.
Chamber Door	◆ Single open door ◆ Anti-explosion ◆ Anti-condensation electric heating device ◆ Vacuum auto-defog transparent window ◆ Window floodlight
Cable Port	Install a Φ50mm test hole on the left of the machine, and equip related seal device for connecting with power test
View Window	Designed in the door with 230×270mm transparent electric radiant heating film with cavity toughened glass(equipped with anti-condensation function)
Control System	TEMI 1500 Touch Screen LCD, imported from Korea, floodlight switch,main power switch
Cooling System	Refrigeration system, heating device, fan, dewatering device, adjustable back window
Sample Shelf	Adopt 304# stainless bent into net sharp, easy for use, the distance between the material frame could be adjusted(the smallest distance is 50mm),standard equipped two pieces
Electrical Room	Main power breaker, controller, distribution plate, radiating fan, over temperature protector
Heating System	Adopt the scale heat rejection heating pipe P.I.D. control the heating so let the temperature gets the balance
2.0 Refrigerating System	
Refrigeration Method	To keep the cooling rate and minimum temperature requirement,we use single stage refrigeration system
Refrigeration Compressor	Adopt low temperature compressor from European
Cooling System	Air-cooled scale condenser, circulating fan for heat dissipation
Evaporimeter	Finned tube heat exchanger
Throttling Device	Thermostatic expansion valve ,capillary tube
Dry filter	Absorption for the residual water and acidic material from refrigerating fluid in refrigerating system, filtrate the solid impurity grain, copper cuttings of system, keep the normal working of expansion valve and capillary, in case of ice blockage and filth blockage
Refrigerating Fluid	Adopt environment protected refrigerating fluid R404A
3.0 Electrical Control System	
Controller	Korea SAMWON, LCD touch screen controller TEMI 1500
Display Interface	◆ Display screen dimension：5.7 inches colorful touch screen conversational mode ◆ Temperature set value (SV) , current value (PV) displays directly ◆ Can display the temperature output value ◆ The execute program number, section, procedure time and time signal control condition can be displayed ◆ Can display auto-calculus picture and procedure standby light-flooding picture ◆ Can display record data and curve condition picture ◆ Can display current curve and edit procedure curve and history running curves ◆ Can display fault indicated and simple fault exhaust
Communication	RS-232 communicate interface, can used as monitoring and remote control system, record the test data
Running Method	Program mode / definite value mode
Set Method	English interface, touch screen input
Procedure Capacity And Control Function	◆ Operational procedure capacity：max:120 groups;one procedure could consist of 1 to 99 sections. ◆ Operational memory capacity：1200 sections, could repeat executive command: each command could repeat 999 times, the slope setting of the procedure could be set through the timer shaft, the jointing use could be set among the procedures, the procedure making can adopt dialogue type, easy to operate with edit, eliminate and insert function, 4 groups of time signal output control (can control the test sample ON/OFF option). ◆9 groups of PID parameter setting, the procedure will have the overleap section, keep functions; can show the curve and data collection; date and time adjustment function; button and picture lock(LOCK) function; can connect the computer, 8 points of DI abnormal input and 10 points of DO signal control

SD Storage Card	Used to store test date and test curve, standard storage capacity is 2G, storage time is about 2 years
Setting Range	Up/down limitation of maximum temperature range is 5℃
Display Resolution	Temperature: 0.01℃; time: 1min;
Memory Function when Power off	Can set recovery mode in case of power off : heating/ cold/ stop
Make an appointment function	Can set available machine time randomly, after turn on the power, the machine will run automatically
Input	PT100 type platinum resistor
Curve record function	Equip with battery protection RAM, can save the set value, sampling value and sampling time of the machine; Max record time is 60 days (when the sampling cycle is 1.5min)
Software use environment	IBM PC compatible machine, above PⅡ CPU, more than 128M RAM, simplified Chinese Windows2000 or simplified Chinese WindowsXP operation system.
Circulating fan	Low noise with many wing centrifugal fan
Heater	Import nichrome electronic heater and heater control mode is contactless equal cycle recurrent pulse adjust wide, SSR (solid–state relay)
Control Mode	Anti–integral saturation PID, BTC balance adjust temperature control mode (temperature test equipment)
4.0 Humidify and Dehumidify System	
Water Supply	Big water tank
Humidify And Dehumidify Method	Adopts outer humidify, compressor start to dehumidify, P.I.D controls the humidify volume to reach the need humidity
Water Quality Request	Resisitivity ⩾500Ω·m
Water Supplement Method	Chamber reserves the water supplement port and water level viewing window, please supply water when the water level is too low
Humidify Water Supply	Inner equipped with a micro water pump, and only needs to add water to the water tank. The water pump is automatically added to the humidifying boiler according to the water level in the humidifying boiler
5.0 Safety Protection Device	
Refrigerating System	Compressor overheat/over current/ over pressure, condensation fan overheat
Test Chamber	Over temperature limitation, fan/motor over temperature relay
Power	Earth leakage protection, overload protection, short–circuit protection
Installation Site Requirement	◆ the distance between the wall and left/right/back should be at least 600mm(A/B) ◆ the distance between the wall and the front side of the machine should be at least 1200mm(C) ◆ please make sure the gate, gallery and elevator could pass the machine in case of affect to your company normal working
Storage Environmental Requirement	Environmental temperature of the machine keep within 0℃ ~ +40℃

Biuged–Designed Control System

Controller TEMI 1500

Refrigeration compressor from Europe

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

BGD 881/S

Standards

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

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

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

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

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

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

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

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

DIN 50021 《Salt Spray Testing》

Features

1.0 Structure Feature	
Chamber Structure	◆ Cabinets are made of imported 1.5mm PVC ploy 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 damater 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 ange 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 requirments, 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	E5CC digital display temperature controller imported from Omron, Japan. control working room and humidifying tower temperature
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: ≤ ± 0.5℃ (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/S

Ordering Information → Technical Parameters ↓	BGD 880/S	BGD 881/S	BGD 882/S	BGD 883/S
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	1150×1090×650	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	1m^3/h	1m^3/h	2m^3/h	2m^3/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)

New Programmable Salt Spray（Fog）Cabinets

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

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

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

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

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

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

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

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

Standards

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

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

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

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

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

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

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

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

DIN 50021 《Salt Spray Testing》

Main Technical Parameters：
★ Working Room Temperature Range：RT+5℃～55℃
★ Humidifying Tower Temperature Range：RT+5℃～65℃
★ Temperature Uniformity：≤ ±2℃ （No-load）
★ Temperature Stability：≤ ±0.5℃ （No-load）
★ Temperature Deviation of Working Room：±1.0℃
★ Temperature Increasing Rate：RT→50℃ less than 45 minutes（working room）
Rt→63℃ less than 45 minutes（saturated barrel）
★ Air supply requirements：filtered dry, waterless and oil-less pressure air,
pressure 0.4～0.8Mpa

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

Cyclic Corrosion Test（CCT）Cabinets

For most artifical accelerated tests in laboratory, getting a consistent testing results with outdoor is the most important purpose. Prior to cyclic corrosion testing, conventional salt spray (a continuous salt spray at 35° C), 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 a typical cyclic corrosion cabinets, 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 Cabinets can perform salt spray, Prohesion, and 100% humidity for most cyclic automotive tests.

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

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

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

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

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

DIN 50021 《Salt Spray Testing》

Features

1. Cabinet Material

◆ Cabinet inner layer is made of 8mm thickness CPVC, the max.enduring temperature is 100℃;

◆ Cabinet outer layer is made of imported 6mm thickness PVC the max.enduring temperature is 85℃

◆ Inner box for controlling dry and humidity is made up of SUS 304# stainless steel, outer box is made of PVC. All insulation Material is made of polyurethane (PU) epispastic plastic

◆ Sealing cover of working room is made of 8mm CPVC, with strengthening treatment. V shape , the top ange is 100o, prevent condensate water during the test from dropping to specimen surface and affect testing results. Moreover ,there is a transparent observing window made of tempered glass (400mm×400mm)

◆ Humidifying Tower：made of SUS304# stainless steel, endurable high pressure and good thermal insulation effect.

◆ Salt Solution Reservior：made of CPVC, 25L capacaity

2. Design Features

◆ **Working**：Sperate dry-wet test from salt spray test. When cabinet is working under salt spray testing, dry-wet controlling system would be closed automatically, avoid effectively salt fog to damage refregeration system. When cabinet runs dry or wet test, system would switch to dry-wet controlling box by ventilation door, and salt spray testing would be stopped automatically. Intelligent TS time signals cycle the cabinet run dry, wet and spray salt test automatically.

◆ **Overall Design**：Left-middle-right arrangement for controlling box and working room：salt solution reservoir, water supply reservoir for humidifying, humidifying tower are on the left, working room in the middle and dry, wet controlling box on the right. Electric system is separated from water system, avoid water to enter electric control box to damage accessories.

◆ **Panel Supports**：A plane indexing rack is designed on the top of working room. Panel racks are divided into three layers: the upper layer is used to put round rod which is made of corrosion-resistant material, the middle layer is used to put V shape glass fiber rack. Through V shape rack and round rod position, the exposuring angle of specimen panels can be adjusted to three different as 15 °、30°、45° The last layer is used to put big sample, a punched CPVC board is designed at the bottom of working room , this board is above the heating layer of cabinet (height from bottom is approx..250mm).with distributed uniformly holes design, it can avoid gathering too much solution, also be in favor of air-circulation in working room.

3. Spray Fog System

◆ **Spray Fog Principle**：Use Bernouilli's principle to absorb salt solution then atomize it, no any salt would crystallize at the spray nozzle and ensure a uniform fog distribution in whole the working room and continuous testing.

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

◆ **Sprya Apparatus**：There is one or two atomizer towers in the middle of working room, ensure a uniform fog distribution in the room. At the bottom on atomizer tower, a salt solution supplying container is installed, in this container, there is a corrosion-resistant float for controlling water level which is used to control water level in the container automatically. Spray nozzle is installed above the container within 100mm height to ensure siphon range for spraying. On the top of spray nozzle, there are some extended CPVC pipes which ensure what the tested samples get are all fog ions, avoid condensate water because of imcomplete atomization during the test from dropping to specimen surface and affect testing results.There is a subulate block whose height can be adjusted on the top of pipe, by adjusting the taper height, spraying amount can be adjusted to the standard requirements（1～2ml/80cm^2・h）

◆ **Fog Collectors**：Tow fog collectors （tapered funnels whose diameter are 100mm）are used to monitor spray fog amount, one is near the atomizer tower and the other is far from. At the bottom of the funnel, there is a silicone pipe which connect with graduated cylinder installed outside. Operator can check the amount of collecting liquid in the graduated cylinders to judge if the spray fog amount is enough or not.

◆ **Spray Nozzle**：Made of special glass, can control fog amount and spraying angle

◆ **Spray Fog or Drain-away Fog**：Spray fog can be done by manual or setting a program. Draining-away fog also can be run by manual or setting a program（feed fresh compressed air to working room then drain away the fog of the working room quickly）

4. Main Components

◆ **Sealing System**：Cabinet body is seald by high-temperature resistant and corrosion resistant silicone rubber, ensure

corrosive gas don't leak. A air cylinder is designed to control cabinet's cover lifting up and down（by manual or automatically, and speed can be adjusted by air pressure.）,simple to operate. Moreover, specially designed air-door device can switch between salt spray test with temperature-humidity test, avoid effectively corrosive gas to enter the dry-wet controlling box and damage some components.

◆ **Air Circulation System**： There is a air room and a stainless steel wind turbine, through ventilation door, air is blowed out thourgh the air duct. Thus the air which have been adjusted to required temperature and humidity would be distributed to working room, then attain the goal which can ensure to get a stable working room with uniform temperature and humidity

◆**Heating System**：Control heating amount by PID , then arrive a temperature balance. Humidifying and warming room adopts a Inconel heater, a wind turbine to supply air for a strong circulation. For working room, heating tube is made of titanium alloy heating tubes, heat air directly. For humidifying tower, uses a Armoured SUS316# electirc heating tube to heat water. Pressured air enter the hot water, then overflow by the bubbles, thus get constant temperature and pure air for sprying

◆**Humidifying and dehumidifying system**：adopt water steam to humidify and run the compressor to dehumidify. P.I.D control humidifying amount to get the required humidity.

◆ **Humidifying Tower**：Is made of SUS304# stainless steel.In order to ensure the pressured air for spraying is pure and with constant temperature, there is a specially designed heating apparatus for filtering air. Moreover, there are controlling water level apparatus, heating apparatus and controlling temperature system in this humidifying tower.At the bottom of tower, there are many small holes for overflowing pressured air.

The outside of humidifying tower connect with oil-water separator and pressure regulating valve of the air source. Pressure air to required value firstly then let air enter heating system, and water of humidifying tower through the small holes at the bottom of tower, and overflow by bubbles, then arrive the top of tower and supply the spray nozzle for spraying.

There are two water level sensors for supplying water automatically, one is near the bottom, the other is near the top, ensure humidifying tower's water level keep stably a required height , then ensure not only to get a pure saturated vapor, but also keep pressured air temperature be within required range for a long time. At the same time, there are also water level monitoring and limitation value alarm functions

5. Operation System

◆ **Imported programmable TEMI 2500 controller** （**Touch screen**）：5.7 inches, 800×480 lattice, TFT colorized LCD screen, show current working room temperature value and set temperature value, current RH value and set RH value, temperature current value and set value of humidify tower, set time and running time of test. At the same time, all shown temperature, RH and salt fog change datas can be recorded and downloaded in real-time

◆ **Programmable**：spray time and interval time can be set freely, max.continuous spraying time is 999.9 hours, max. spraying time for discontinuous spray is 99 hours and 59 minutes,max interval time（no spray）is 99 hours and 59 minutes; Can edit 120 programs, each program consists of 1～99 segments. Memory capacity is 1,200 segments and can execute command repeatedly （each command can be executed for 999 times）.Different program time can be combined to run, segment time can be set from 1minute to 999 hours.

◆ **Communication Function**：RS-485/RS-232 interface, with local and telecommunication function. System come with a monitoring softwar（need one COM port of PC）, and can connect up to 16 computers. Operator can transfer freely all datas collected by monitoring software to EXCEL format

◆ **SD Card**：Come with a SD memory card, a software CD for PC. User can edit a program by software specialized for PC and store it in the SD card, then call out this program and store it in the controller. Of course, user also can copy the program in the controller to SD card, then store it in the PC to manage and analyze.

User also copy the testing data graph stored in the controller to SD card, then show or print it by PC software（the printed data has a remark "no revise"）, or transfer it to Access data file by Microsoft office.Test data graph recorded by controller is : 2 routes temperature （set temperature and real-time temperature）; 2 routes relative humidity（set RH and real-time Rh）

Biuged–Designed Control System

Controller TEMI 2500

RS–232 Interface

6. Cooling System

◆ Cooling methods：Use a set compressor as cooling system, including a low-temperature cooling compressor imported from Europe, fined tube radiator, air-cooled scale-type condensation evaporator and throttle device （thermal expansion valve/capillary）, and use environment-friendly refrigerant R404a/R23 as this cooling medium of this system.

◆ Features：

A. All pipelines of system have passed by 22kg pressure leakage checking

B. Heating system and cooling system is separated completely.

C. With our company professional technology, design a special protection system to avoid high temperature and high pressure to start compressor

D. All programs run cooling sysem are controlled by micro-computer completely.

E. At the bottom of compressor, there is a drain pan which is used to collect condensation water generated from frosting

F. Compressor comes with PTC temperature sensor, can protect itself once the temperature is over.

G. With high or low pressure protection device, it can monitor the pressure of refrigerant when the chamber is working. Once the refrigerant pressure is higher than limiting pressure or lower than the lowest pressure set by system, it can alarm and power off till troubleshoot all problems.

H. The whole cooling system is imported from imported brand, reliable quality and ensure a stable system.

7. Safety Devices

◆ **Cooling System**：For compressor, over-heat, over-load, over-pressure and over-temperature protectiuon

◆ **Chamber**：Over limiting temperature protector, balance pressure automatically protector,prevent water at the bottom protector

◆ **Humidifying System**：Dry heating protector, water shortage protector for humidifying tube,

◆ **Heating System**：Over limiting temperature protectorand short circuit protector for heating tube

◆ **Power**：Over-load protector, short circuit protector for main power. Over-load protector, short circuit protector , over the upper limit temperature protector, over-temperature protector for controlling wiring

◆ **Circulating Fan**：Over-load protector, short circuit protector and anti-reversal protector

Ordering Information → Technical Parameters ↓	BGD 886/S	BGD 887/S	BGD 888/S
Working Room Size (W×H×D), mm	900×400×600	1250×500×1000	1600×500×1000
Working Room Capacity （no including V shape cover）	216 L	600 L	800 L
Overall Size (W×H×D), mm	2450×1550×1430	2830×1560×1830	3230×1656×1830
Power/Max. Current	16KW/21A	23.6KW/28A	28KW/35A
Power Supply	AC 380V 3 phase 20A	AC 380V 3 phase 23A	AC 380V 3 phase 25A
Temperature Range	RT+10℃～80℃		
Temperature Uniformity	±2℃		
Temperature Stablity	±0.5℃		
Humidity Range	20%～98%		
Humidity Uniformity	±5% RH		
Humidity Stablity	±2% RH		
Salt Fog Precipitation	1～2ml/ 80cm^3.h（Adjustable）		
Spray Method	Continuous or Cyclical		
Required Work Environment	Tem.: 5～30℃; RH: 45%～85%RH; Barometric Pressure: 86kPa～106kPa		
Required Air Supply	Air consumption: 1m^3/h, Pressured air without water and oil which has been dried and filtered, pressure is （0.4～0.8）Mpa		
Required Water Supply	Supplied by tap water, which is used for humidifier to pressure, heat and filter air. Water pressure should be （0.2～0.4）Mpa **Note**: Distilled water or deionized water is required for preparing spray solution,water consumption is near 20L/24hour under continuous spraying）		

Note：Temperature uniformity and stability datas are tested under 25℃ environment temperature, RH = 85%and no any samples

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.

★ **Ordering Information:** BGD 1285---ISO Scratching Tool
BGD 1285/V---V shape cutter
BGD 1285/U---U shape cutter

Automatic 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:

- 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
- Permanent magnet working platform, easy to load the magnetic substrate..
- With scale indication, easy to cut different size scratch.

Main Technical Parameters：
★ Working Distance: 0~150mm
★ Scribe mark Depth: 0~2000μm
★ Test panel Thickness: 0~5mm（include the thickness of the coating）
★ Overall Size: 374mm×320mm×410mm
★ Working Platform Size: 250mm×125mm
★ Ordering information:
BGD 539--- Automatic Scribe Marks Machine for Corrosion Testing

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 Amercian 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

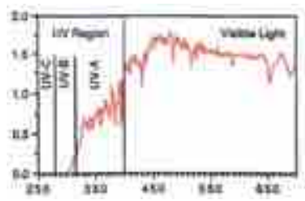
The ultraviolet rays of sunlight are the main factor who damage weathering resistance of most materials. We use UV lamps to simulate the short wave part of sunlight, it produce few visible lights and infrared lights. According to different testing requirements, we choose different wavelength UV lamps, 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:

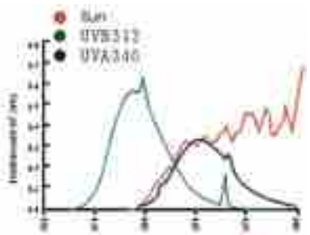
① **UVA-340 Lamp:** UVA-340 Lamp can highly simulate short-wave ultraviolet light of sunlight, the wavelength range is from 365 nm to 295 nm.

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

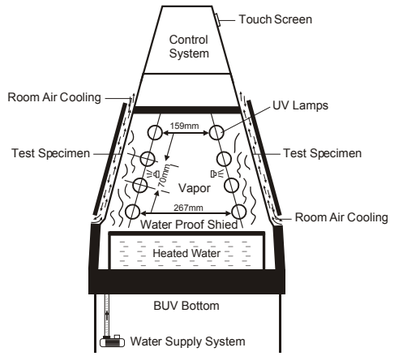
UV Light Accelerated Weathering Tester

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

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

Test Methods & Material Standards

- ISO 16474-1 《Paints and varnishes -- Methods of exposure to laboratory light sources -- Part 1: General guidance》
- ISO 16474-3 《Paints and varnishes — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps》
- ISO 11507《Paints and varnished-Exposure of coatings to artificial weathering- Exposure to fluorescent UV lamps and water》
- ISO 4892-1《 Plastics-Methods of exposure to laboratory light sources-Part 1: General Guidance》
- ISO 4892-3《 Methods of exposure to laboratory light sources-Part 3: Fluorescent UV lamps》
- ASTM D 4587《Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings》
- ASTM D 4329《Standard Practice S for Fluorescent UV Exposure of Plastic》
- ASTM G-151《Standard Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that use laboratory light sources》
- ASTM G-154《Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Non-Metallic Materials》
- BS 2782:Part5, 《Method 540B (Methods of Exposure to Lab Light Sources) 》
- SAE J2020《Accelerated Exposure of Automotive Exterior Malts Using a Fluorescent UV/Condensation Apparatus》
- JIS D 0205《Test Method of Weather-ability for Automotive Parts》



BUV Test principle

Main Technical Parameters：
★ Light Source: UV–A (wave length 340 nm) or UV–B (wave length 313 nm) ; 40W × 8 pcs (The normal use–life is 6,000 hours)
★ The range of Irradiance: 0.1 W/m^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（75 × 150mm standard samples）or 15 pieces of 100 × 300mm
★ Adjustable range for water supply: 0–4LPM
★ Water Consumption： 7L/day（for condensation）； 3L/minute（for spray）
★ Overall Size: 1,360 × 520 × 1,300mm（L × W × H）
★ Net weight: 161 kg Total Max. Power： 3KW
★ Power: 220VAC ± 10%/50HZ（60 HZ is custom）； 15A (Max Electric Current)

Feature

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

All BUV machines use fluorescent UV lamps produced by Amercian 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 Amercian 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 lift to 6,000 hours, save use-cost greatly for users.**

Original UV lamps from America

Four sensors monitor BUV irradiance

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

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

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

As any other lamps, UV lamps energy of BUV also decreases as time increase. The control system would compensate it automatically through strengthening the voltage of lamps. But as the using time become longer and longer, the energy of lamps decrease continuously. For some high set point of irradiance, BUV couldn't keep this irradiance any longer, and now the system of BUV would reminder failure " the error of irradiance is too large" and shut off the machine. Now, the operator should calibrate the BUV by standard calibration radiometer. If machine still can't get the set point after calibrating, the user should replace the two pcs lamps corresponding to the relative sensor and calibrate again.

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

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

Calibration Radiometer

BUV Calibration Windows

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

◆ **Water Spray and Condensation function**

Water spray

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

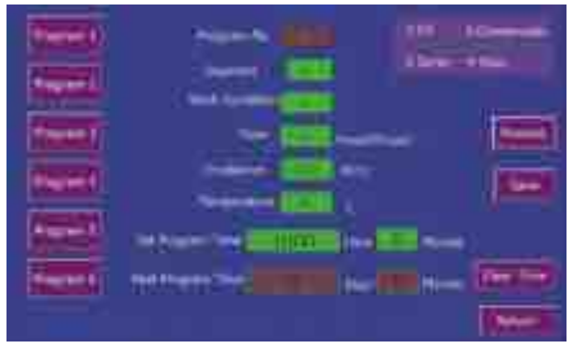
Condensation

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 Set Test Program Windows

BUV Set Test Parameter Windows

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

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

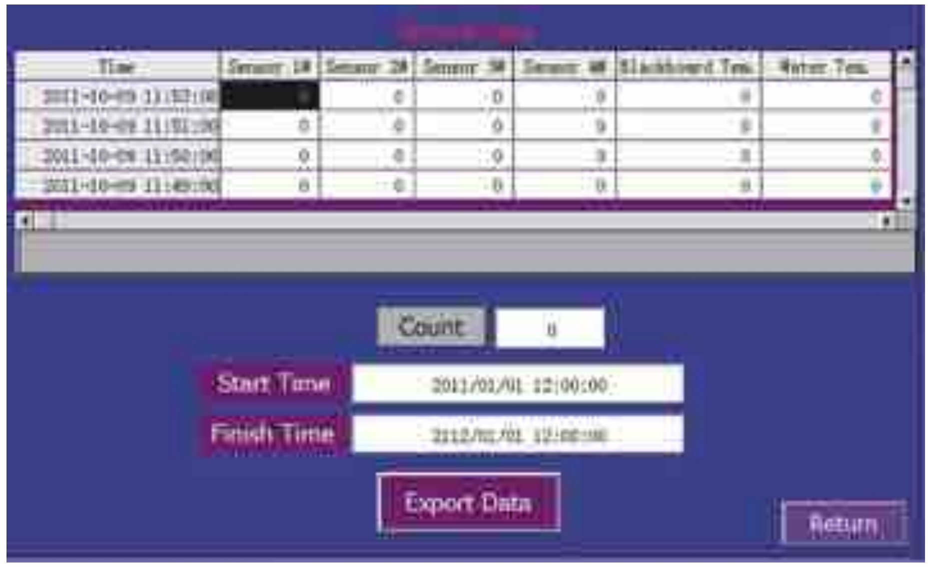
BUV can permit operator to edit six test programs at most and save it permanently. Generally speaking, if the operator has set and saved one program in the BUV, for next test, if he still use this same program, just choose this program and run BUV directly, no need to set again.

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

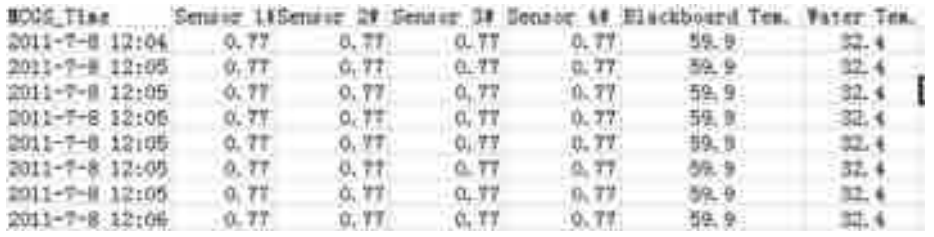
BUV all controllings and showings are finished by a high definition colorful touch screen. Menu operation interface is very convenient for operator to use and maintain BUV. During the working, all parameters are show on the touch screen.

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

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



BUV Import Data Windows



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

Format of Import Data

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

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

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

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

◆ **Ordering Information:**

BGD 855 ––– Basic Ultraviolet Light Accelerated Weathering Cabinet（No irradicance control）

BGD 856––– Ultraviolet Light Accelerated Weathering Cabinet

BGD 8110： UVB lamps (40W/313nm)

BGD 8111： UVA lamps (40W/340nm)

BGD 8118： Calibration Radiometer (310nm&340nm)

BGD 8130： Sample Shelf

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 UV 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 150×70mm）. 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 compariability 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 (UVA new lamp)

◆ Full stainless steel inner working room with sandwich design, never getting rusty and leakage. Also prevent water vapour coming from working room from entering electrical box and damaging electron components.

◆ Biult-in water level switch, it will alarm and stop running automatically when under low water level.

Main Technical Parameters：
★ Total power：1.2 KW
★ Power voltage：220 ± 22V/50 ± 0.5Hz
★ Setable temperature range of working room：RT+5℃ ~ 60℃
★ Setable range of test time ：1h ~ 9,999h
★ Setable range of spray time：1min–9,999min
★ Setable range of spray interval time：1min–9,999min
★ 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：930 × 460 × 630mm（L × D × H）:
★ Net Weight：72kg

★ **Ordering Information:**

BGD 852––– Bench UV Light Accelerated Aging Chamber
BGD 8100––– UVB lamps (20W/313nm)
BGD 8101––– UVA lamps (20W/340nm)

Working Room

Operation Menu

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, disluster, 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》

All B-SUN Types

Ordering Information→ Parameters ↓	BGD 865A Bench Xenon Chamber	BGD 866A Small Xenon Chamber	BGD 860 New Xenon Chamber	BGD 862 Big Xenon Chamber
Xenon Lamps	1 piece 1.8KW air-cooled Americian xenon lamp		1 pc 1.8KW air-cooled Americian xenon lamps	1 piece 6.5 KW water-cooled Americian xenon lamp
Filters	Extended UV filters	Daylight Filters	Daylight Filters	Daylight Filters
Sample holder	Flatbed	Flatbed	Rotating drum	Rotating drum
Samples Capacity （150×70mm）	9 pieces	9 pieces	22 pieces	65 pieces
Edit Program	No	Yes（6 programs）	Yes（10 programs）	Yes（6 programs）
Spray Function	No	Yes（front of panel）	Yes（front & back）	Yes（front & back）
Dark Function	No	Yes	Yes	Yes
Control BPT.	Yes	Yes	Yes	Yes
BPT. Range	RT+30℃～90℃	RT+30℃～90℃	RT+30℃～100℃	RT+20℃～110℃
Working room Tem. Range	——	——	RT+65℃	RT+70℃
Control Irradiance	Yes	Yes	Yes	Yes
Irradiance Range （300～400nm）	30～100W/m²（Chinese lamp） 50～120W/m²（Americian lamp）		50～120W/m²	30～150W/m²
Monitoring method to irradiance	1	3	4	4
Monitor cumulative Energy	No	Yes	Yes	Yes
Control work room relative humidity	No	No	Yes	Yes
Export test data	Yes	Yes	Yes	Yes
Alarm Function	Yes	Yes	Yes	Yes
Calibration Function	Yes	Yes	Yes	Yes
Pure water machine	No	Optional	Yes	Optional

B-SUN Filter

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

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

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

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

Monitoring Method to Irradiance

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

Narrow band: 340 nm or 420 nm

Broad band: 300-400 nm

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

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

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

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

① Bench Xenon Test Chamber

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

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

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.

Characters

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

Main Technical Parameters：

- ★ Xenon Lamp：one 1.8KW xenon lamp imported from America
- ★ Filter：Extended UV filter （Also can choose daylight filter or window glass filter）
- ★ Irradiance monitor methods：340nm or 420nm（Narrow band） or 300nm～400nm（Broad band）（Choose anyone before ordering）
- ★ Lamp Lifetime: Near 1,500 hours
- ★ Exposure Area：1,000 cm² (can put 9 standard samples 150×70mm)
- ★ Adjustable Irradiance Range：30W/m² ～100 W/m² (300~400nm) or 0.3W/m² ~0.8 W/m² (@340nm) or 0.5W/m² ～1.5 W/m² (@420nm)
- ★ Adjustable Black Panel Temperature Range：RT+30℃～80℃ （Depends on environment temperature and setting irradiance value）
- ★ Interior Material of Chamber：Stainless steel –SUS 304 material
- ★ Exterior Material of Chamber：Powder coating
- ★ Overall Size：950×570×540mm
- ★ Net Weight：93KG（130KG Gross weight）
- ★ Power Supply：220V 50/60HZ（Alternative）
- ★ Max Current：12A
- ★ Max.Power：2.5 KW
- ★ **Ordering Information:**

BGD 865/A---Bench Xenon Test Chamber
BGD 8156--- American Xenon Lamps （1.8 KW）
BGD 8140---Xenon Calibration Radiometer（340nm）
BGD 8141---Xenon Calibration Radiometer（420nm）
BGD 8142---Xenon Calibration Radiometer（300nm～400nm）

Operation Menu

② Small Xenon Test Chamber

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

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

Characters

◆The test procedures can be programmed freely; and up to 16 predetermined procedures can be saved in one time. Every procedure includes up to 10 segments setting data.

◆ Can set the cumulative energy （total irradiance energy）obtained by sample to finish a test procedure.

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

◆The xenon light source correspond with international standards; ensure reproducibility and comparability of testing results.

◆ Irradiance energy can be accurately controlled. The "**Closed-Loop**" control system can automatically compensate the change of light intensity caused by ageing or other factors.

◆ Users can easily calibrate and adjust the irradiance or the black panel temperature by themselves.

◆ With High precision Pt100 Temperature sensor. Black panel temperature is auto-controlled during the whole process

◆ Alarm function for protection: Over temperature of BPT, big error for irradiance, auto shut-down protection when opening door，protection for too low air pressure

◆ Touch screen and user-friendly operation interface allow operator to set the test parameters and monitor all the test process easily.

◆ Specimen mounting and evaluation is fast and easy With unique slide-out specimen tray

◆ Real-time data can be collected and recorded. The incidental USB connector allow users to copy the test data into a USB drive, achieving unattended operation.

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：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+30℃~90℃ （Depends on environment temperature and setting irradiance value）
★ Interior Material of Chamber：Stainless steel –SUS 304 material
★ Exterior Material of Chamber：Powder coating
★ Overall Size：1000×650×1020mm
★ Weight：135 KG（176KG Gross weight）
★ Power Supply：220V 50/60HZ（Alternative）
★ Max Current：12A
★ Max.Power：2.5 KW
★ **Ordering Information:**
BGD 866/A---Samll Xenon Test Chamber
BGD 8156---American Xenon Lamps （1.8 Kw）
BGD 8140---Xenon Calibration Radiometer（340nm）
BGD 8141---Xenon Calibration Radiometer（420nm）
BGD 8142---Xenon Calibration Radiometer（300nm~400nm）
BGD 8170---Pure Water Machine（50L/h）

Xenon
Calibration Radiometer

③ Xenon Test Chamber（New）

BGD 860 is a powerful, highly cost-effective, easy to use and convenient to maintain xenon test chamber. It uses a air-cooled xenon lamp and relevant daylight filter（both are imported from America）, 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.

Operation Menu

BGD 8170 Purity Water Machine

Main Technical Parameters：
★ Xenon Lamp：One 1.8KW 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：2,200 cm^2 (can put 22 pcs samples 150×70mm 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 300～400nm)
★ Controlling irradiance point：340nm or 420nm or 300nm～400nm （show at the same time ）
★ Adjustable Black Panel Temperature Range：RT+30℃～100℃
★ Adjustable relative humidity of working room：20%～75%（Light ）；50%～95%（Dark ）；
★ Interior Material of Chamber：Stainless steel –SUS 304 material
★ Exterior Material of Chamber：Powder coating
★ Overall Size：860×800×1740mm
★ Net Weight：200KG
★ Power Supply：AC 380V（Three–phase four–wire system ）/ 50HZ；Max. Current 16 A
★ Total Machine Power：5.5KW
★ Ordering Information:
BGD 860---Xenon Test Chamber
BGD 8156---Ammerican Xenon Lamps （1.8 KW ）
BGD 8140---Xenon Calibration Radiometer（340nm ）
BGD 8141---Xenon Calibration Radiometer（420nm ）
BGD 8142---Xenon Calibration Radiometer（300nm～400nm ）
BGD 8170---Pure Water Machine（50L/h ）
BGD 8179---Air Compression System（Includes air compressor、air reservoir、freezing dryer、precise filter etc ）

④ Big Xenon Test Chamber

BGD 862 is a multi-function big xenon light accelerated weathering testers which is equipped with one piece high power （6.5KW） water-cooling xenon lamp, its exposure area arrive 6,500cm^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^2 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.

◆ 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. With ultrasonic wave humidifying system, the working room can obtain more stable and uniform humidity distribution.

◆ Can set spray way to sample（front spray or back spray）, spray time and spray interval time.

Simple, easy to use

◆ Colorful touch screen and user-friendly operation interface allow operator to set the test parameters and monitor it easily.

◆ The test procedures can be programmed freely; and up to 16 predetermined procedures can be saved in one time. Every procedure includes up to 10 segments setting data.

◆ 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.

◆ 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.

Working room

Operation–Menu

Main Technical Parameters

Ordering Information → Technical Item ↓	BGD 862 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	6,500 cm^2 (63–65 pcs standard samples of 15cm × 7cm size)
Monitoring Method to Irradiance	Four types: 340nm, 420nm, 300nm ~ 400nm, 300nm ~ 800nm Showing at the same time
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 Declination	≤ ±1℃
Adjustable Humidity	Light: 10%–85% Dark: 10%–95%
Rotate speed of sample	1r/min (circle as lamp centre)
Spray Function	Can set spray continuous time and spray period
Water demands	High purity deionized water (Conductivity<2us/cm)
Flow of Deionized Water	0.2L/min (Add humidity or spray)
Overall Size	1,200×1,135×2,050mm (L×W×H)
Net Weight	500 KG
Structure	
Cabinet Material	Working room is made up of good quality stainless steel (SUS 316)
Chamber Door	Simple door to left with filter window; silicon rubber seal the door edge
Sample Holder	Stainless steel material, its position in the chamber can be adjusted (up, middle or down), Sample crack rotate around the centre of lamp
Controller	Siemens programmable controller. LCD touch–screen
Way of adding humidity	Add humidity by high pressure aerosol
Thermometer	Heat insulate type black standard thermometer and black board thermometer
Cooling System	Cooled by compressor and forced–air blast system
Security Protections And Error Protections	
Xenon Lamp Protect	Over temperature of cooling water, low flow of cooling water, abnormal of lamp power
Alarm Function	Big irradiance difference, over–temperature of BPT or BST or Working room, big error of humidity, spraying water shortage, pure water conductivity is over limits. Operator can set these values and downtime
Pure System Protect	Monitor the conductivity of pure water at real–time (Once the conductivity≥2us/cm, the machine will stop and alarm)
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; 32A 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

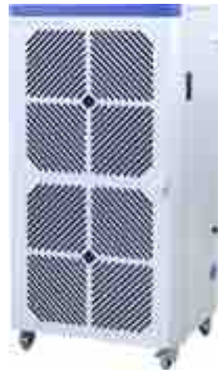
Products	Numbers	Manufacture	Notes
Xenon Lamp	1pc	Atlas	6.5KW (Also select other USA brand)
Filter	1set	Atlas	Includes five inner filters and one 4.5K/6.5K outer filter (S BORO/S BORO)
Control System	1set	SIEMENS	S7–300 PLC+ Siemens analog imput
Interface	1pc	MCGS	10" human–computer touch screen

Table B: Adjustable Range of Irridiance

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

Optional Accessories

BGD 8140–––Xenon Calibration Radiometer (340nm)
BGD 8141–––Xenon Calibration Radiometer (420nm)
BGD 8142–––Xenon Calibration Radiometer (300nm ~ 400nm)
BGD 8158–––ATLAS 6.5KW Xenon Lamp (Water–cooled)
BGD 8159–––USA brand 6.5KW Xenon Lamp (Water–cooled)
BGD 8160––– ATLAS 2000 HRS Supply PKG (Includes one BGD 8158 ATLAS 6.5KW water–cooled lamp, 5pcs S65 inner filters, one pc 4.5K/6.5K outer filter)
BGD 8161–––6.5KW BGD 2000 HRS Supply PKG (Includes one BGD 8159 USA brand 6.5KW water–cooled lamp, 5pcs W–143 inner filters, one pc W–144 outer filter)
BGD 8171–––Purity Water System (100L/min, pure water can less than 0.1 μ S/cm (input water < 200 μ S/cm))
BGD 8176–––Cooling Water Machine (For cooling and cycling pure water, can greatly reduce water consumption)
BGD 8179–––Air Compression System (Includes air compressor、air reservoir、freezing dryer、precise filter etc)
BGD 8186–––Daylight Filter
BGD 8187–––Window Glass Filter
BGD 8192–––Metal Frame Air Filters
BGD 8197–––Sample shelf



BGD 8176

BGD 8171

Others

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 ~ 629.9μinch	0.020 ~ 100μm/0.780 ~ 400.0μinch
	Rt	0.020 ~ 160μm/0.780 ~ 4000μinch	-----
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 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 ↓	One-Channel	Four-Channel		Seven-Channel	
	BGD 951	BGD 954/1	BGD954/2	BGD 957/1	BGD 957/2
Number of Channels	1	4	4	7	7
Temperature range	-100℃ ~ 300℃	-100℃ ~ 300℃	-100℃ ~ 500℃	-100℃ ~ 300℃	-100℃ ~ 500℃
Duration	45min for 200 ℃ 60min for 150℃	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℃	0.1℃		0.3℃	0.5℃
Accuracy	0.5%	0.5%		0.5%	
Storage	Can store 32,000 readings. Record per seconds for 5 hours	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, 10s	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 Print the Tem.Curve with Computer ③ Check the data with EXCEL	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	No	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 ◆ 2 pcs Thermocouple (0.5m, 1.5m) ◆ USB cable ◆ Setting software ◆ Manual	◆ 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)	ϕ63 × 160	110 × 125 × 300	135 × 155 × 300	100 × 120 × 280	130 × 160 × 300

Professional Thermocouple Thermometer

BGD 948 is a professional contact-type precise thermometer with white blacklight LCD, it has two channels K-type thermocouple to measure temperature. It's widely used in many fields needed to measure temperature.

Features:

- Use K-type thermocouple to test temperature, resoluation can arrive 0.1℃
- With temperature compensation, ensure accuracy when measuring temperature.
- Reading value can be converted ℃/℉
- Auto. Power-off
- Hold max. value and hold test results.
- Can change thermocouple

Main Technical Parameters：
★ Temperature Range：–50~1300℃
★ Accuracy：±1℃~±1.5℃
★ Resolution：0.1℃
★ Error：±0.5%±1℃
★ Power Suppy：9V battery（work for 48 hours）
★ Size/Weight：165×76×43 mm/403g
★ Accessories: 9V battery, Holster with stand, Type K temperature probe and gift box with carrying case.
★ **Ordering Information:** BGD 948––– Professional Thermocouple Thermometer

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	160×82×42 mm		146×104×43 mm
Weight	177g		163g

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 (Big Screen)

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
- Max. hold and data hold function
- Dew point & wet bulb temperature
- High accuracy and high performance
- Dual display & backlight

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

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±1KG
★ **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

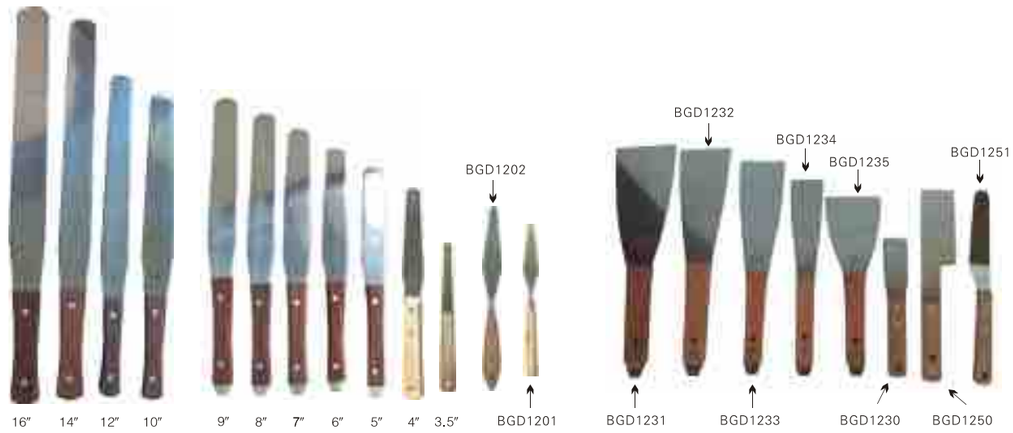
Spatulas

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.

Ording 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

Ording 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

Main Technical Parameters:

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

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

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	Chromated
	BGD 2321	150×70×0.5	180 pcs	Chromated
	BGD 2322	120×50×0.8	300 pcs	Chromated
	BGD 2323	150×70×0.8	180 pcs	Chromated
	BGD 2324	120×50×1.0	300 pcs	Chromated
	BGD 2325	150×70×1.0	180 pcs	Chromated
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 D 344
- Repeatable color and gloss-lot after lot
- Superior adhesion characteristics, especially with latex paints
- Rugged design （ 0.5 mm thickness）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

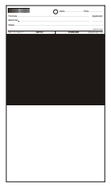
- With excellent solvent resistance
- Repeatable color and gloss-lot after lot
- Smooth, structure free surface
- Superior adhesion properties and flexibility
- With 0.5mm thickness
- Double film laminated will not warp and bend-even in high humidity environments.

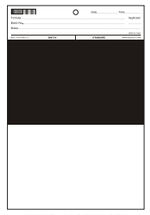
Selection of test charts dependent on application

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

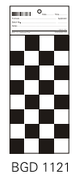
A uniform paint film is applied on a black/white contrast chart. After air drying the drawdown can be objectively evaluated using the BIUGED opacity meter. The operator is menu guided through the measurement procedure and the opacity value is displayed automatically in a second.

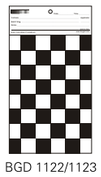
The same procedure can be applied for transparent films and plastics.

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 D 344 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：

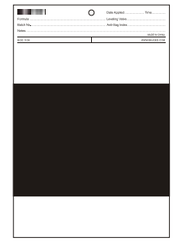
Ordering Information	Description	Material	Dimensions（mm）	Qty/Box
BGD 1110	Opacity–Display Charts	Film Laminated	250×140	500
BGD 1111	Display Spreading Charts	Film Laminated	289×194	500
BGD 1112	Opacity–Display Charts 9A	Clear–coated	250×140	500
BGD 1113	Display Spreading Charts 8B	Clear–coated	289×194	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 （289×194mm；500pcs/box）

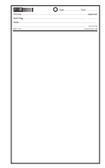

BGD 1109

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（150×100 mm；1,000pcs/box）
BGD 1133---Plain White Drawdown Charts（250×140 mm；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.

Properties	ZR64	ZR85	ZR95
ZrO_2 content	50%--60%	85%	94.5%
Density	⩾ 4.0g/cm^3	⩾ 5.3g/cm^3	⩾ 6.0g/cm^3
Bulk	2.3g/cm^3	3.3g/cm^3	3.7g/cm^3
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/cm^3
- ★ Artificial Proportion: 1.5g/cm^3
- ★ Micro-rigidity: =635kg/mm^2
- ★ 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; 4.0–4.5mm; 4.5–5.0mm;

★ **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/cm^3
- ★ Artificial Proportion: 1.5g/cm^3
- ★ Micro-rigidity: ⩾680kg/mm^2
- ★ 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; 3.5–4.0mm (Optional)

★ **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 210 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 5 x 15 cm.
- 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 210 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 210 RAL CLASSIC Colours
- Five colours per page
- Simple 4-digit coding system
- Colour swatches measure 2cm x 5cm
- Fan deck size 5cm x 15cm
- Gloss finish

PANTONE Plus Series Formula Guide （2019 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 2,161 PANTONE colours, 294 more than the previous edition（2016 Version）, 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:

- 2,161 solid PANTONE Colours 294 new additions
- Same reference numbers as previous edition new numbers begin at 7548
- 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 1601A---Pantone Forumula Giude

GP-1601A

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° orotation is available, it easily operated.quest with variable specifications of power, lift distance and centre distance between the base and the scattered axles.

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 5-10μm, 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				
Includig 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				
Includig Single-layer 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	Page
ISO 1514			Biuged Brand Test Substrates	155
ISO 1518-1			Automatic Scratch Tester	68
ISO 1519			Cylindrical Mandrel Tester	72
ISO 1520		DIN 53166 DIN 53232 BS 3900	Cupping Tester	75
ISO 1522	ASTM D 4366	DIN 1522	Pendulum Hardness Tester	70
ISO 1524	ASTM D 333 ASTM D 1210	BS 3900-C6 BS 3900-E9	Fineness of Grind Guage	16
ISO 2115	ASTM D 2354		Min.Film Forming Temperature Tester	25
ISO 2409	ASTM D 3359 ASTM D 3002	BS 2409 DIN 2409 EN 2409	Cross Hatch Adhesion Tester Cross Cutting Rule	62 63
ISO 2431	ASTM D 5125		ISO Flow Cups	2
ISO 2555 ISO 2884 2	ASTM D 2196		Rotary Viscometer	5~14
ISO 2592			Open Cup Flash Point Tester	
ISO 2719 ISO 3679	ASTM D 93		Closed Cup Flash Point Tester	
ISO 2808	ASTM D 1212 ASTM D 4414		Wet Film Comb Thickness Gauges Rolling Wheel Thickness Gauges	58
ISO 2808 ISO 2360 ISO 2178	ASTM B 499 ASTM D 1186 ASTM D 1400 ASTM D 7091	DIN 50981 DIN 50984	Dry Film Thickness Gauge	57~60
ISO 2811	ASTM D 333 ASTM D 1475 ASTM D 2805	DIN 53217 BS 3900-A 19 DIN 53217	Specific Gravity (SG) Cups	20
ISO 2813 ISO 7668	ASTM D 523	DIN 67530 DIN 2813 EN 2813 EN 7668	Glossmeter	45~49
ISO 2815		DIN 53153 EN 2815 BS 2815	Buchholz Indentation Hardness Tester	67
ISO 3248			Precise Oven	111
ISO 3668	ASTM D 1729		Color Assesment Cabinet	27
ISO 3906 ISO 6504 ISO 2814	ASTM D 2805 ASTM E 97	DIN 55984 BS 3900-D6/D7	Reflectance Meter/Opacity Meter	23
ISO 4624	ASTM D 4541 ASTM D 7234		Pull off Adhesion Tester	65
ISO 4630-1 ISO 6270.1 ISO 6270.2			Gardner Color Comparator with C Illuminant Climatic Chamber Climatic Chamber	28 118 119
ISO 6272.1			BGD 306 Impact Tester	74
ISO 6272.2	ASTM D 2794		BGD 305 Impact Tester	74
ISO 6819 ISO 6860	ASTM D 522 ASTM D 1737	BS 3900-E11 DIN 53150 DIN 66669	Conical Mandrel Bend Tester	73

ISO Standards	ASTM Standards	Other Standards	Instruments	Page
ISO 7253 ISO 4623-1	ASTM B 117		Salt Fog Cabinets	123
ISO 7619	ASTM D 2240	DIN 53505	Shore Hardness Meter	71
ISO 7724	ASTM D 2244 ASTM E 308 ASTM E 1164	DIN 5033 DIN 5036 DIN 6174	Spectrophotometer	54
ISO 7784-2			Rotational Abrasion Tester	79
ISO 16474-2 ISO 11341 ISO 4892.2	ASTM D 6695 ASTM G 155 ASTM D 3451		Xenon Chamber Tester	141~147
ISO 11507 ISO 16471-3			UV Light Accelerated Weathering Tester	134
ISO 11998		DIN 13300 BS 3900-F17	BGD 526/2 Wet Abrasion Scrub Tester	76
ISO 13803	ASTM E 430		Haze Glossmeter	49
ISO 15184	ASTM D 3363	BS3900-E19	Pencil Hardness Tester	66
ISO 17132	ASTM D 4145	EN 13523-7	T-bend Tester	73
	ASTM C 346 ASTM C 584 ASTM D 2457		Special Glossmeter	49
	ASTM D 1200 ASTM D 333 ASTM D 365		BGD 125 Ford Cups	2
	ASTM D 2486		BGD 526/1 Wet Abrasion Scrub Tester	76
	ASTM D 2794	JIS-K5400	Dupont Impact Tester	75
	ASTM D 2801		BGD 226/1 Leveling Tester	21
	ASTM D 333 ASTM D 968 ASTM D 1395 ASTM D 2205		BGD 529 Falling Sand Abrasion Testers	81
	ASTM D 3450		BGD 526/3 Wet Abrasion Scrub Tester	76
	ASTM D 3730 ASTM D 4400		Sagging Tester	20
	ASTM D 4138		Paint Inspection Gauge	
	ASTM D 4212 ASTM D 816 ASTM D 1084		BGD 126 Zahn Cups	3
	ASTM D 4213		BGD 526/4 Wet Abrasion Scrub Tester	76
	ASTM D 4828		BGD 526/5 Wet Abrasion Scrub Tester	76
	ASTM D 5264		Rub Resistance Tester	
	ASTM D 562	BS 3900-A7-1	Krebs Stormer Viscomter	13
	ASTM D 5895/A		Line Drying Time Recorder	24
	ASTM D 823		Automatic Film Applicator	40~42
	ASTM D 823 ASTM D 3258		Applicator	36~40
	ASTM F 2357-04		RCA Paper Abrasion Wear Testers	81
		BS 3962-6	Cross Cutting Rule	63
			BGD 521 Solvent Resistance Tester	79
		NYPC	BGD 226/2 Leveling Tester	21
		DIN 53211	BGD 127 DIN Flow Cups	4
		DIN 53778	BGD 526/6 Wet Abrasion Scrub Tester	76
		DIN 55667	Conductivity Meters	30