BOTO
GROUP

Programmable Ozone aging test chamber

Technical solution

BOTO GROUP

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The detailed parameters of the ozone aging test machine are as follows:	
一、Product performance	
1.1.Product name 1.2.Model 1.3.Volume 1.4.Working size 1.5. External size 1.6.Power	Ozone aging test chamber BT-150A 150L 500*500*600mm 1050*970*1750mm 380V
1.7.Application	The content of ozone in the atmosphere is very small, but it is the main factor for rubber cracking. This product simulates and strengthens the ozone conditions in the atmosphere, studies the action of ozone on rubber, and quickly identifies and evaluates the rubber's anti-ozone aging performance and anti-ozonant protection. Efficiency method. Reference standards: GB/T7762-2003 Vulcanized rubber or thermoplastic rubber resistance to ozone cracking static tensile test method; GB/T2951.21-2008 General test method for cable insulation and sheath materials; GB/T 11206-2009 Rubber Aging test surface cracking method, and other test methods specified in relevant standards;ISO 1431-1:2012, Rubber, vulcanized or thermoplastic - Resistance to ozone cracking.
1.8.Principle and method	The test method can be divided into "static" and "dynamic" according to the test method and standard. Static means that the sample is stretched and placed in the test box for testing. Dynamic means that the sample is placed on the fixture of the test box and stretched while stretching. While doing the test, the tensile fluctuation is about 5%-45% of the tested sample itself.

二、The main technical parameters	
2.1.Temperature range 2.2.Temperature fluctuation 2.3.Temperature distribution accuracy 2.4.Humidity range 2.5.Ozone Concentration Accuracy	2.1 RT+10℃-40℃（When testing ozone, the temperature should not exceed 40℃, and the ozone will decompose automatically） 2.2 — ±0.5℃ 2.3 — ±2.0℃ 2.4 — 35%~95%R.H(The standard requires the test humidity to be below 65%) 2.5 — 0~1000pphm ±15%
三、Structural features	
3.1.Structure	Integrated machine
3.2.Material	a) Inside material: SUS304 stainless steel plate b) Outside material : SUS304 stainless steel plate c) Insulation: double protection of rigid polyurethane foam + aluminum silicate insulation cotton.
3.3.Door	a) Single door, open left. b) Window frame/door frame two silicon rubber sealing strips and anti-condensation electric heating device. c) Observation windows W300xH450mm and lighting lamps are equipped on the doors and windows.
3.4.Sample shelves Requirements	a) Fix both ends of the sample with clamps under the required elongation, and when in contact with ozonated air, the length direction of the sample should be basically parallel to the airflow direction; b) Fixtures should be made of materials that do not readily decompose ozone, such as aluminum; c) Sample preparation should comply with the provisions of GB/T 9865.1. Test specimens are preferably cut from newly molded test pieces or, if necessary, from finished products. Samples should be at least 3 samples

	for each test condition. The width of the long standard sample is not less than 10mm, the thickness is 2.0mm ± 0.2mm, and the length of the sample between the two ends of the clamp before stretching is not less than 40mm。
3.5.Control panel	a) Controller Display b) Switch c) Fault alarml
3.6.Chamber configuration	a) One built-in stainless steel SUS #304 shelf turntable; b) φ50mm Lead hole: 1, and equipped with hole cover and silicone rubber plug; c) 4 mobile casters d) 4 horizontal fixed tripods; e) There is a drainage hole at the bottom of the rear of the box for the convenience of draining the condensed water of the unit; （8 cm in diameter） f) Three-phase five-wire system (four-core cable + protective earth wire); 1 cable (3 meters long).
四、Air circulation regulation	
4.1.Method 4.2.Circulating fan	FLOW THROW Air supply method ; Horizontal diffusion Vertical heat exchange arc circulation; Power-saving motor + stainless steel extended shaft connected to multiple centrifugal circulation fans.
五、Heating system	
5.1.Heater	Finned heat dissipation tube stainless steel electric heater heating; 

5.2.Control method	PID regulation, actuator: solid state relay. 
六、Refrigeration system	
6.1.Working method 6.2.Control method 6.3.Compressor 6.4.Evaporator 6.5.Condenser 6.6.Expansion system 6.7.Refrigerant 6.8.Refrigeration process 6.9.Refrigeration accessories 6.10.Annex	Mechanical refrigeration/air cooling; The controller of the control system automatically adjusts the operating conditions of the refrigerator according to the test conditions; European and American famous brand low-temperature high-efficiency hermetic compressor（France,Tecumseh）  Fin type multi-stage automatic load capacity adjustment(Japan；Saginomiya) Air condenser;  (Japan, Shuangling) Refrigeration system with automatic capacity control; Environmentally friendly refrigerant R404  (Ozone depletion index is 0),(USA, DuPont); Nitrogen protection welding, double-stage rotary vane pump vacuuming to ensure the internal cleanliness of the refrigeration system, a water tray is designed at the bottom of the compressor, and the condensed water is discharged out of the box through the drain pipe at the back of the chamber. a) Expansion valve (Denmark,DANFOSS) b) The electromagnetic valve (Japan; Omron)

	c) Filter (Denmark,DANFOSS) d) Pressure controller (Denmark,DANFOSS) e) Stop valve (Italy,CASTEL) f) Oil separator (European and American,ALCO) Desiccant, oil separator, refrigerant flow window, repair cutting, high pressure protection switch.
Ozone detection system	
1. Ozone generator	(use voltage silent discharge tube to generate ozone)  臭氧发生器系列
2. Ozone sensor	The ozone concentration sensor imported from the UK can achieve precise  臭氧浓度传感器 control
3. Ozone Exhaust System	After the experiment is completed, the ozone in the experimental box is exhausted to the outside through a dedicated exhaust fan and air duct.
七、Control System	
7.1.Sensor 7.2.Controller	The temperature sensor adopts platinum DIN PT-100Ω; Adopt Youyi brand 5.4-inch color LCD touch-control human-machine interface controller, super large field of vision screen, with screen lock (LOCK) function. Chinese and English switching 

7.3.Controller Specifications	a) Accuracy:±0.1℃＋1digit; b) Temperature resolution: 0.1; c) Each time setting range: 0.1 second to 320 hours can be set freely; d) Temperature input signal, Platinum PT100 type;  e) P.I.D control parameter setting, P.I.D automatic calculation.
7.4.Screen display function	a) It adopts the screen-conversation type of graphic control software, and the options are directly touched on the screen: including program setting, curve display, historical data, manual operation, automatic operation, auxiliary setting, etc. b) Display the execution status, temperature and time setting value, remaining time and remaining cycle times. c) It has a separate program editing screen, which can input temperature, time and cycle times. d) The temperature program setting is displayed as a graphic curve, and it has the function of displaying the program curve in real time. e) Display the fault state and explain the troubleshooting method. f) Temperature setting (SV) and actual (PV) values are directly displayed. g) The screen can be used for backlight adjustment, and the screen display protection function can be used for timing and closing settings.
7.5.Program capacity and control functions	a) The production of the program adopts a conversational function. b) Number of cycles: adjustable up to 1-9999 times. c) Available program groups: up to 96 PATTEN (that is, 96 test specifications can be set and stored independently) d) Each impact time can be set: 0～540Hour59Min. e) The residence time at room temperature can be set: 0～540Hour59Min. f) With power-off program memory, it will automatically start and

	continue to execute the program after power is restored. g) Graphical curves can be displayed in real time during program execution. h) It has the function of scheduled startup and shutdown. i) With date and time adjustment function.
八、Safety protection device	
8.1.Cooling protection	a) Compressor overheat protection switch b) Compressor high pressure protection switch c) Compressor overcurrent protection switch
8.2.Heating protection	a) Heater surface temperature over-temperature protection b) Heater short circuit, overload protection device
8.3.Other protection	a) Cycle motor overheat protection b) Condensing fan overheat protection c) High temperature, low temperature, over temperature protection d) Reverse phase, phase loss protection device, e) No fuse switch overload protection. f) Smoke alarm machine power failure protection device. g) Line Fuses and Fully Sheathed Terminals
九、Accessories and random document	

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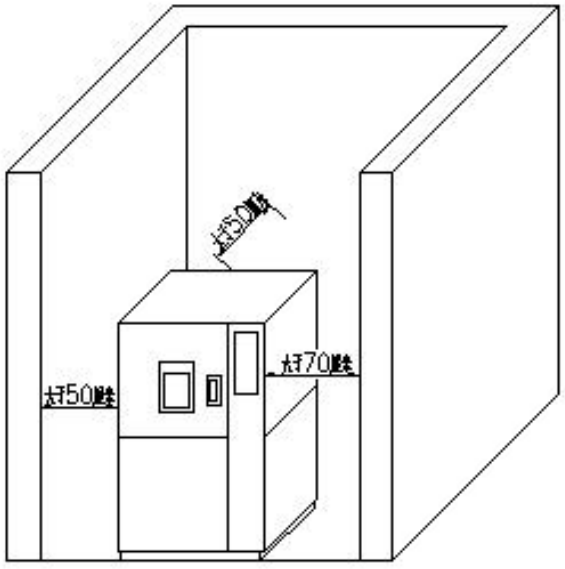
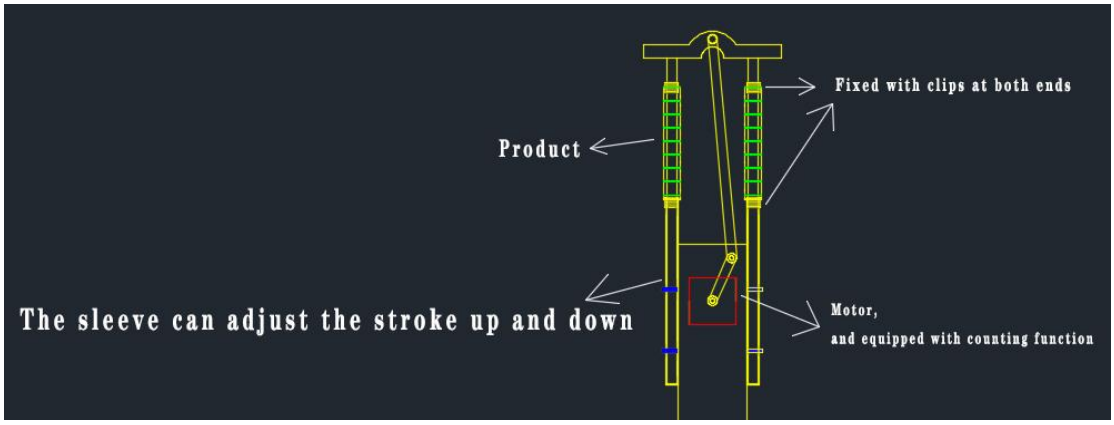
9.1.Shelves 9.2.Shelf track 9.3.Power test hole 9.4.Power cable 9.5.Drain 9.6.Air source interface 9.7.Mobile casters 9.8.Fixed foot cup 9.9.Maintenance manual	SUS304 stainless steel shelf 2 layers (single layer load 10kg) Stainless steel adjustable spacing 40mm shelf track 4 1 power test hole, located on the left side of the box, with cover and soft plug, size ¢50mm×100mm One power cord (2 meters long) 220V 3.5KW One drainage hole (diameter 8cm) One air source interface (diameter 8cm) 4 mobile casters 4 horizontal fixed foot cups An operation and maintenance manual
9.10.Controller manual 9.11.Warranty Card	A controller manual a warranty card

十、Conditions of use of equipment

10.1.Power supply 10.2.Water source 10.3.Gas source 10.4.Environmental conditions 10.5.Channel requirement	The power cord is located at the back of the machine/AC220±5%V /50±0.5Hz Tap water (users need to provide cooling water tower) The interface diameter is 8 centimeters, and the pressure is 5 to 8KG Temperature: 5℃～30℃ Relative humidity: ≤85% This device is heavy. Please consider the aisle of the installation site and the way of handling in advance (see the main technical indicators for dimensions and weight)
10.6Site requirements	a) It is best to have a drain floor drain or connect a drain pipe near the test chamber. b) Place the on-site wall to configure the equipment with an air or power switch of corresponding capacity (30A) c) The use of the ground should be flat, well ventilated, and free of flammable, explosive, corrosive gases and dust 

Ozone aging test chamber configuration list:		
Cooling System	**Material name**	**Quantity**
Compressor	Tecumseh(France)	1
Condenser	Fin type heat dissipation fan (Keweili)	1
Evaporator	Customization (Zhongli)	1
Expansion valve	Danfoss/Honeywell(Denmark)	2
The electromagnetic valve	FDF(SANHUA)	2
The electromagnetic valve	FDF(SANHUA)	2
Pressure controller	Danfoss (Denmark）	1
Oil separator	S-4004（Taiwan,JINQIAN）	1
Filter	EMERSON(Emerson）	1
RefrigerantR404A	R404A Honeywell（USA）	Appropriate amount
Miscellaneous items such as copper pipes	Taishun (Taiwan,China)	1
Measurement and control system	**Material name**	**Quantity**
Temperature and humidity control instrument	Youyi	1
Over temperature protection instrument	EGO(CHNT)	1
Temperature Sensor	Pt100	2
Humidity Sensor	Pt100	1
Contactor	CJX2(CHNT)	2
Solid state relay	SSR(Taiwan,FOTEK)	3
Time delay relay	ANV(Taiwan,FOTEK)	2
Intermediate relay	Omron(Japan)	Several
Heating rod	1 Kw	2
Humidification tube	1Kw	1
Switching power supply (leakage protection)	DZ47LE(CHNT)	1
Transformer	Customization	1
R232 communication interface and software	For monitoring and data logging (optional)	1
Control switch panel	Customization	1
Audible and visual alarm	TAIAN(Taiwan,China)	1
Heater protection	TAIDE(Taiwan,China)	1
Fluorescent lamp ballast	OSRAM(Germany)	1
Ozone sensor	Prada	1
Ozone generator	BEYOK	1
Ozone generator pump	BEYOK	1
Ozone Tensile Fixture	Customization	1
Inner material 8K mirror stainless steel	Lisco(Guangzhou)	Some
External material brushed stainless steel	Lisco(Guangzhou)	Some

(Reference picture)



(The fixture reference picture, please prevail in kind)

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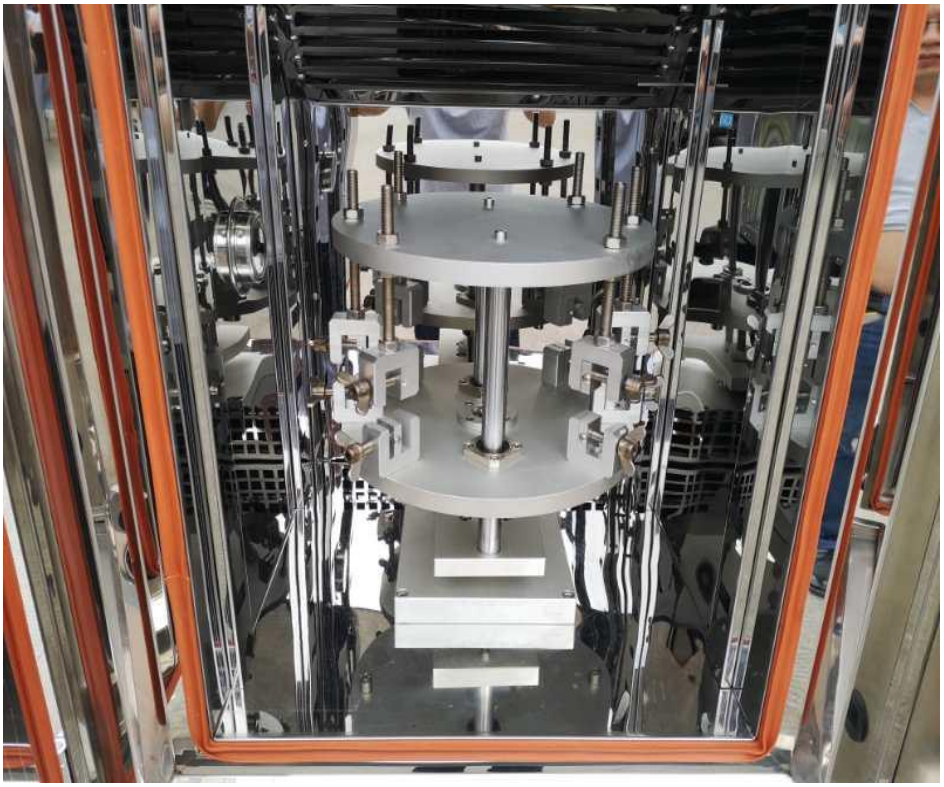

(Inner chamber reference picture)

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Factory real pictures display

1.Certificate

ISO certificate


注册号：00921Q11072R0S

长城（天津）质量保证中心有限公司

质量管理体系认证证书

兹证明 上海柏毅试验设备有限公司

（统一社会信用代码/注册号：91310114561890453L）

位于 注册地址：上海市嘉定区安亭镇永盛支路8号6幢A区

邮编 201804

办公/服务地址：上海市嘉定区曹安公路5616号财富广场2304室

邮编 201805

其质量管理体系符合 GB/T19001-2016/ISO9001:2015 标准

该质量管理体系认证范围

温度试验设备、检测试验设备的销售。

颁证日期 2021年6月18日 有效期至 2024年6月17日

长城（天津）质量保证中心有限公司 总经理

IAF CNAS 中国认可 国际互认 管理体系 MANAGEMENT SYSTEM CNAS C009-M


Registration No.: 00921Q11072R0S

CHINA GREAT WALL (TIANJIN)
QUALITY ASSURANCE CENTRE CO., LTD
QUALITY MANAGEMENT SYSTEM CERTIFICATE

We hereby certify that
Shanghai BoYi Test Equipment Co. Ltd.
(Unified social credit code:91310114561890453S)
Registered address is located at: **Area A, Building 6, No. 8, Yangmuqiao Branch Road, Anting Town, Jiading District, Shanghai.** Post Code: **201804**
Office/Service address is located at: **Room 2304, Fortune Plaza, No.5616 Caoan Highway, Jiading District, Shanghai.** Post Code: **201805**
Its quality management system meets the requirements of the **GB/T19001-2016/ISO9001:2015 Standard.**
The quality management system applies in the following areas:
Sales Of Temperature Test Equipment, Testing Test Equipment.
Date of Issuance: **Jun. 18th, 2021** Date of Expiry: **Jun. 17th, 2024**

General Manager

IAF CNAS 中国认可 国际互认 管理体系 MANAGEMENT SYSTEM CNAS C009-M

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Some patents (nearly 100) and certificates

Some patents (nearly 100) and certificates

Hot & Cold test chamber

- 2017 Annual News Stone Hero List Quality Award

China Printed Circuit Industry Association

Joint Laboratory of Power Battery Safety Testing

Shanghai BOYI & Beijing Jiaotong University

China quality club enterprise member

2.Shanghai Office :

3.Factory environment area

Work shop

Our team

4.Spot exhibition hall area\finished product area


5.BOTO GORUP Factory located in Hunan Yueyang Industrial Park.

The industrial park is constructed by Shanghai Boyi Test Equipment Co., LTD with a total investment of RMB 400 million. Mainly engaged in the research and development and manufacturing of the whole chain of laboratory equipment; It is located next to yueyang section of Wuhan-Guangzhou high-speed railway, adjacent to Lotus Airport, and has very convenient transportation. The industrial park covers an area of 40 mu, consisting of a comprehensive office building and two standard factories, with a total construction area of nearly 20,000 square meters



Showroom 1

Showroom 2

6.On December 23, 2021, Li Aiwu, deputy Secretary of CPC Committee and Mayor of Yueyang city, Hunan Province, led the participants of yueyang City industrial project construction mobile site meeting to inspect our company and observe the construction of industrial projects.

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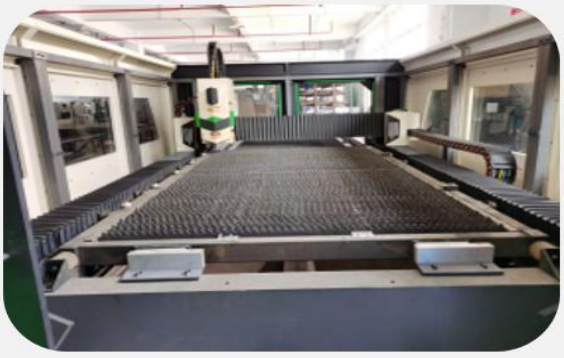
7.After the industrial park is fully put into operation, it can meet the annual output of new energy 3C semiconductor electronic circuit optical communication industry laboratory testing room environment simulation box 1200 sets; Another company has an independent sheet metal production and processing center, can independently undertake manufacturing business.







8.Standard size machine

20 L constant temperature and humidity test chamber

225L High and Low Temperature Humidity and Heat Alternating Test Chamber

Overlapping Temperature and humidity chamber

Thermalshock test chamber

Double layer constant temperature test chamber

Salt spray test chamber

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150LVertical high and low temperature test chamber

Ventilation type aging test chamber

Leaning tower ultraviolet aging test chamber

9 .Large non-standard real pictures display area

3.6 m3 constant temperature humidity laboratory

9 cubic meters low temperature room, 13 cubic meters high temperature room

Three comprehensive and test chamber

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10.Shipment




Self-produced and sold **No dealer link** **Save you 30%** **Quality and after-sales are recognized by customers**