AOPTEK®
Advanced Optics

Product Catalogue

GLASS MEASUREMENT INSTRUMENTS

Architectural Glass Measurement
Automotive Glass Measurement
Solar PV Glass Measurement

FOCUS ON OPTICS

http://www.aoptek.com
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Beijing Aoptek Scientific Co.,Ltd.

PROFILE

• Science • Sincerity • Innovation • Progress

Aoptek is located in Fengtai Science Park, Beijing, China, and always committed to the development and production of glass optical testing instruments, it can be traced back to the Broadtitan Institute in 1990, and it was then formally changed its name to Aoptek Scientific Co. Ltd, founded by Dr. Zhang Zhemin in optics.

As business covers energy-saving architectural glass, automotive glass, solar photovoltaic glass and traditional optical measurement. Our products and technologies are widely used in glass production lines, laboratories and project sites to measure optical and thermal parameters such as spectrum transmittance, spectrum reflectance, color, color difference, haze, stress, abrasion, sheet resistance, U value, etc.

With more than 30 years of technology accumulation, Aoptek has developed devices such as the Filmonitor series for online measurement, the Filmeasure and GlasSpec series of desktop instruments for laboratory use, as well as the GlasSmart and GlassMeter series of portable devices for field measurements. All our products are extensively used in glass production lines and laboratories. In the near future, Aoptek will remain as innovative as ever do our best to meet the needs of the glass industry.

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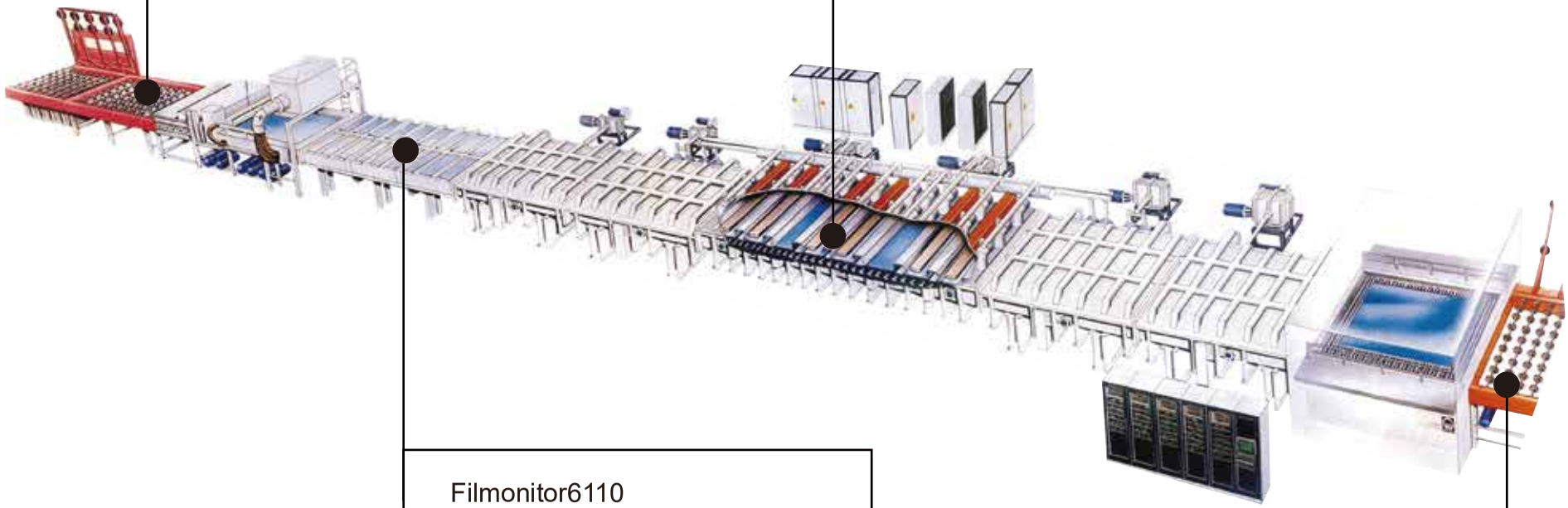


Filmonitor6110
Online Spectrum Transmittance
Measurement System

Filmonitor6300
Spectrum T&R Traversing
Measurement System

TS2600
Online Automatic Tin Side Detection System

Online detect tin side automatically.

Brief

TS2600 is an intelligent and automatic tin side detection system for float glass. It is applied in the further processing of float glass, such as laminating， tempering, coating, screen-printing, colored glazing, etc. It can detect the tin side of float glass rapidly and effectively, satisfy deep processing needs. effectively, satisfy deep processing needs.

Functions

1. Automatically detect the tin side of float glass.
2. With indication and alarm signals.
3. With external extension signal interface.

Parameters

Item	Parameters	Item	Parameters
Working mode	Online	Glass thickness	1～19mm
Response time	0.5s / 1.0s	Transmission range	>20%
Upper head size	100*140*204mm	Lower head size	240*63*230mm
Control box size	210*100*295mm	Interface	PLC relay interface
Lower head to glass lower side	1~1.5mm	Gap	40mm
Power supply	100~240VAC,50/60Hz	Power	60W

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

Filmonitor6110
Online Spectrum Transmittance Measurement System

Measure spectrum transmittance of glass and can be installed in vacuum chamber.

Brief

The Filmonitor6110 is used to measure the spectrum transmittance of glass in Low-E line, which not only can be installed at the position after washing, but also can be installed in vacuum chamber. It can inspect quality and uniformity of float glass and can monitor the color changes after each coating in vacuum chamber. It is significant for Low-E coating monitoring, especially for double and triple Low-E coating. Filmonitor6110 could measure spectrum on each layer of films so as to strictly control over the color and performance of Low-E glass. To get high quality coating, the system monitors spectrum curve of each layer of film, compare them with the target curve and find difference, thereby to guide technicians to adjust coating techniques, realize overall quality management.

Parameters

Item	Parameters	Item	Parameters
Geometric conditions	8°/ 8°	Wavelength range	380~1000nm
Head mode	Fixed	Wavelength interval	5nm
Light source	Halogen / LED	Wavelength accuracy	≤ 0.3nm
Glass thickness	2~19mm	Wavelength repeatability	≤ 0.1nm
Measuring speed	~ 1s		
Repeatbility	L *,a *,b *< 0.1 RMS		
Reproducibility	L *,a *,b *< 0.1RMS		

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

Filmonitor6300
Spectrum T&R Online Measurement System

Online traversing measure spectrum transmittance and reflectance for PVD line.

Brief

The Filmonitor6300 is installed at unloading table to measure transmittance, reflectance, and color difference of Low-E coated glass. As double and triple silver Low-E coatings are more complex, they are apt to appear color difference at other angles, such as 45° or 60°. So it is necessary to measure the spectrum reflectance at 45°or 60° for double or triple silver Low-E glass. We call this function is off-angle spectrum reflectance measurement, and this function is an option for Filmonitor6300.

Features

- Network connection, flexible configuration.
- Auto dynamic calibration.
- Self-checking function, accident alarm and record.
- Independent software to facilitate upgrade.

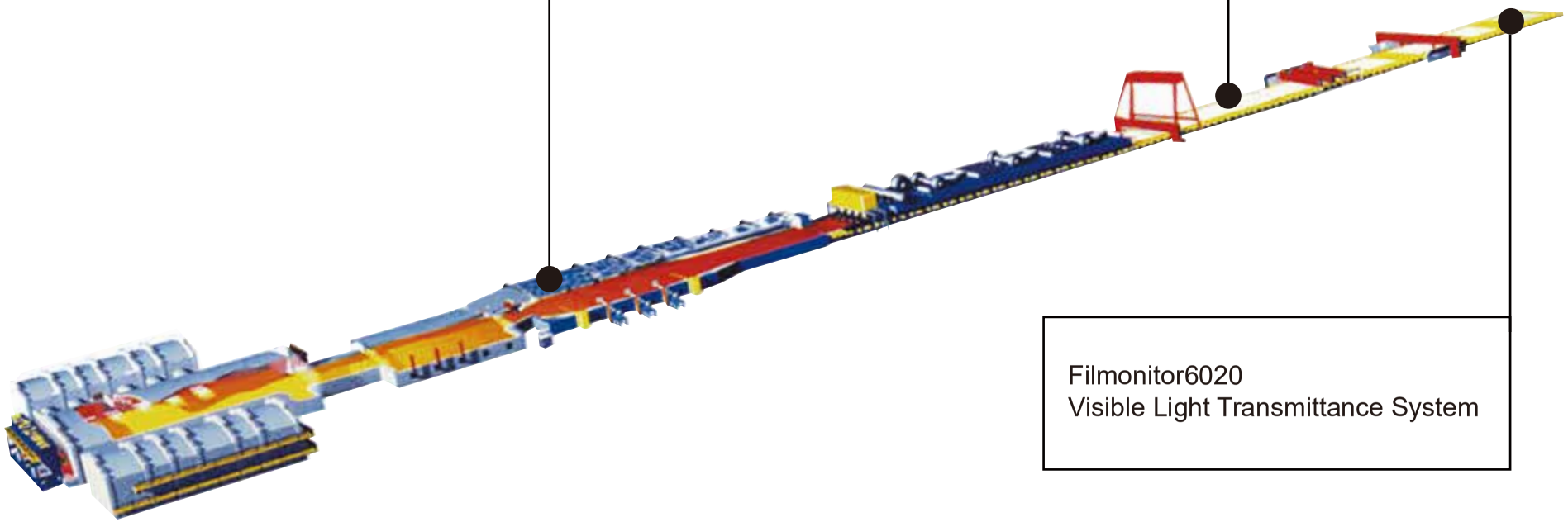
Parameters

Item	Parameters	Item	Parameters
Geometric condition	8° / 8° Transmittance(T) 8° / 8° Film Side Reflectance(Rf) 8° / 8° Glass Side Reflectance(Rg) 45°/45° or 60°/60° Rf (Optional) 45°/45° or 60°/60° Rg (Optional) Sheet resistance (Optional)	Head mode	Traversing
		Light source	Halogen / LED
		Glass thickness	2~19mm
		Wavelength range	380~1000nm
		Wavelength interval	1nm
Wavelength accuracy	< 0.3mm	Wavelength repeatability	< 0.1mm
Repeatbility	L *, a *, b * < 0.1RMS	Reproducibility	L *, a *, b * < 0.1RMS
Measuring speed	≤ 1s for one point measurement	Measure 24 points on 2.54m production line, measuring time less than 20s.	
		Measure 33 points on 3.3m production line, measuring time less than 25s.	

Remark:Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

Filmonitor6200
Spectrum Reflectance
Traversing System

Filmonitor6230
Spectrum Reflectance
System at A0 Area



Filmonitor6020
Visible Light Transmittance System

Filmonitor6230
Spectrum Reflectance Measurement System at A0 Area

Measure the Spectrum Reflectance at A0 area (hot end) of CVD line.

Brief

The Filmonitor6230 is used to measure the spectrum reflectance at A0 area (hot end) of CVD line, which is installed at A0 area (hot end) of float glass production line, where locates at the end of the tin bath. It can rapidly measure spectrum reflectance, and calculate parameters such as color, color difference. It is convenient for technicians to discover coating problems in advance and then to adjust coating process. Because it is installed at hot end, the installation can be done only on production line design period or production line stopped.

Parameters

Item	Parameters	Item	Parameters
Geometric conditions	8°/ 8°	Wavelength range	380~1000nm
Glass thickness	2~19mm	Wavelength interval	1nm
Light source	Halogen	Wavelength accuracy	< 0.3nm
Glass temperature	~ 600℃	Wavelength repeatability	< 0.1nm
Head mode	Fixed		
Measuring speed	≤2s for a measurement of one point		

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

Filmonitor6200
Spectrum Reflectance Online Measurement System

Online traversing measure spectrum reflectance of Low-E glass for CVD line.

Brief

The Filmonitor6200 is used to measure spectrum reflectance of Low-E glass, which can measure the reflectance of clear side or coated side. It can be installed at the continuous ribbon area after annealing, to measure transversal spectrum reflectance and color difference in traversing mode. As Low-E coating is more complex, it appears different color at different angles, such as at 45°. So it is necessary to measure the spectrum reflectance at 45° for Low-E glass. We call this function is off-angle spectrum reflectance measurement, and this function is an option for Filmonitor6200.

This Filmonitor6200 is consist of measuring unit, onsite control box, control computer, onsite network, and software.The computer is connected with control box through a network. Under the control of the computer， the head can measure transversal spectrum reflectance at any position in scanning mode, as well as transversal color difference at multi-points, longitudinal uniformity of glass. The software include functional modules of self-checking, calibration, measurement, data processing, display, print, and data saving, etc.

Parameters

Item	Parameters	Item	Parameters
Geometric conditions	8°/ 8° 45°/ 45°(Optional)	Wavelength range	380~1000nm
Head mode	Traversing	Wavelength interval	5nm
Light source	Halogen	Wavelength accuracy	< 0.3nm
Glass thickness	2~19mm	Wavelength repeatability	< 0.1nm
Measuring speed	~1s		
Repeatability	L *,a *,b *< 0.1 RMS		
Reproducibility	L *,a *,b *< 0.1RMS		

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Filmonitor6020

Multi-Channel Visible Light Transmittance Online Measurement System

Measure visible light transmittance at cold end of CVD line.

Brief

The Filmonitor6020 is used to online measure visible light transmittance for coating production line in real time, which is installed at the position after glass cutting of glass line. It can measure visible light transmittance of multi-points, and then monitor glass quality.

The Filmonitor6020 is consist of measuring unit, control unit, control computer, etc. According to the width of the glass, it is equipped with 5 to 16 measuring heads. Compared with the spectrum transmittance system, its price is lower, but measuring speed is faster.

Parameters

Item	Parameters	Item	Parameters
Geometric conditions	8°/ 8°	Channels quantity	5~16 heads
Illuminant	CIE standard illuminant A	Observer	CIE1931 V (λ)
Head mode	Fixed	Measuring interval	Settable
Light source	Halogen	Consistency of each channels	≤ 0.3%
Glass thickness	2~19mm	Repeatability	≤ 0.3%
Measuring speed	< 50ms / point	Accuracy	1%

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

GlasSpec2500
Optical and Thermal Parameters Measuring Instrument for Glass

Specified Visible and NIR spectrum measurement instrument for architectural glass.
Standard: *ISO 9050 Glass in building; determination of light transmittance, solar direct transmittance,total solar energy transmittance and ultraviolet transmittance, and related glazing factors.*

Spectrum test & g value calculation in one

Wide spectrum 300 ~ 2500nm

Directly measure IG

Brief

GlasSpec2500 is a spectrophotometer which can test UV & Visible & NIR spectrum, and optical and thermal parameters of glazing. The instrument not only can measure the single pane, but also can directly measure the insulating glass without separating.

Functions

Spectrum transmittance $\tau(\lambda)$,Spectrum reflectance $\rho(\lambda)$.
Transmission and reflection color coordinates, color difference.
Solar direct transmittance(τ_e), reflectance(ρ_e), absorptance(a_e).
Total Solar Energy Transmittance (g), Total Solar Infrared Heat Transmittance (g_{IR}), Shading Coefficient (SC), Thermal Transmittance (Ug), Visible Light to Total Solar Energy Transmittance (LSG).

Parameters

Item	Parameters	Item	Parameters
Geometric conditions	8°/ 8°	Wavelength range	300~2500nm
Light source	Halogen		
Interface	RJ45	T/R Range	0~100%
Power supply	100V～240VAC,50/60Hz		
Sample thickness	Min: 50mm for normal IG		
Sample size	Min: 50*50mm， Max: 220mm from the edge		
Measuring speed	≤ 10s for full spectrum measurement		
Dimension	500*500*700mm		
Weight	50Kg		

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

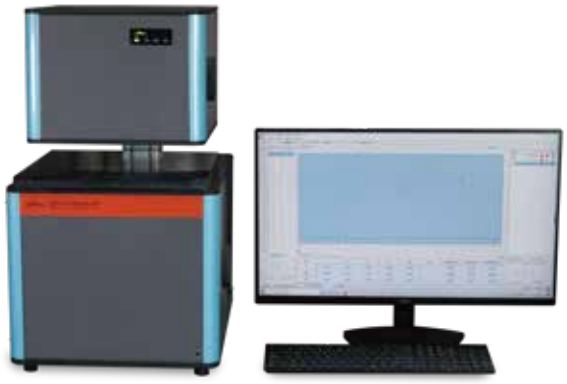
GlasSpec1000
Spectrum Transmittance and Reflectance Measuring Instrument for Insulating Glass

Specified instruments to measure Visible and NIR spectrum for IG.
Standard: *ISO 9050 Glass in building; determination of light transmittance, solar direct transmittance, total solar energy transmittance and ultraviolet transmittance, and related glazing factors.*

Wavelength range 380 ~1000nm

Directly measure IG

Single-pane value can be calculated



Brief

GlasSpec1000 is used to measure spectrum transmittance and spectrum reflectance.The instrument not only can measure the optical parameters of single pane, but also can directly measure IG to meet the needs of manufacturers and quality inspection institutions.

GlasSpec1000 can measure the overall direct spectrum transmittance and spectrum reflectance without destroying IG structure. With special software function, we can directly obtain the color parameters of single-pane glass.

Functions

Spectrum transmittance $\tau(\lambda)$, Spectrum reflectance $\rho(\lambda)$.
Visible transmittance (τv), Visible reflectance(ρv).
Color coordinates(Yxy、L*a*b*), color difference(ΔE).

Parameters

Item	Parameters	Item	Parameters
Geometric conditions	8°/ 8°	Wavelength range	380~1000nm
Light source	Halogen	T / R Range	0~100%
Interface mode	RJ45	Wavelength resolution(FWHM)	3~5nm
Glass thickness	< 45mm	Wavelength accuracy	0.3nm
Sample size	Min:50*50mm, Max: 220mm from the edge	Measuring table size	400*410mm
Dimension	500*400*700mm		
Power supply	100~240VAC,50/60Hz,150W		
Measuring speed	≤ 5s for full spectrum measurement (T/Rg/Rf)		
Weight	45Kg		

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

Filmeasure2200
Off-angle Spectrum Reflectance Instrument

Indispensable instrument for double and triple silver Low-E glass.

45° or 60° Spectrum reflectance

Fast get spectrum data

Brief

The Filmeasure2200 is used to measure the spectrum reflectance of IG at the special angle of 45° or 60° , which is necessary for the double silver or triple silver Low-E glass, because the Low-E glass often occur color difference at these off-angles.

Functions

Spectrum reflectance $\rho(\lambda)$.
Color parameters Yxy, L*a*b*, ΔE.

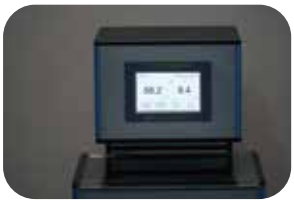
Parameters

Item	Parameters	Item	Parameters
Geometric conditions	45°/45° or 60°/60°	Wavelength range	380~1000nm
Light source	Halogen	Reflectance range	0~100%
Interface	RJ45	Wavelength interval	1nm
Measuring table size	500*500mm	Wavelength resolution(FWHM)	3~5nm
Dimension	610*550*520mm	Power supply	100~240VAC,50/60Hz

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

GTR-3
Visible Light T&R Meter

Measure visible light transmittance and reflectance.



Brief

The GTR-3 is used to measure visible transmittance and reflectance for flat materials, such as flat float glass, colored glass, and coated glass. Scattered light cannot be measured. This instrument is not necessarily equipped with a computer, which is economical and easily used.

Functions

Visible light transmittance, Visible light reflectance.

Parameters

Item	Parameters
Geometric conditions	8°/ 8°
Illuminant	CIE standard illuminant A
Observer	CIE1931 V (λ)
Repeatability	0.2%
Accuracy	1%
Sample size	Min:50*50mm， Max: less than 110mm from the edge
Sample thickness	Max: 30mm
Dimension	330*260*500mm
Power supply	100V~240VAC,50/60Hz,3A
Power	60W

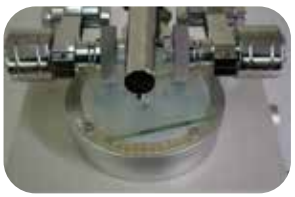
Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

BTA-5000
Abrasion Tester

Test the abrasion performance for glass.
Standard: *ISO 3537 Road Vehicles. Safety Glazing Materials. Mechanical Tests Third Edition.*

No need drilling

Abrasion test



Brief

The BTA-5000 is used to test abrasion for float glass, coated glass, and automotive glass. It is also essential for paint, coat, plastic layer, metal layer, plastic, textile, ceramic tile, wood floor, laminate floor, acrylic, furniture, and other materials to test for firmness and abrasive resistance. The instrument is an intelligent product controlled by a microprocessor, which was developed by Aoptek in domestic.

Parameters

Item	Parameters
Rotation speed	55~75 RPM
Rotations	25,50, 100, 200, 300, 400, 500, 1000, 2000, 5000
Sample	Ø100 or 100*100mm
Dimension	300*320*250mm
Weight Load	500g (1000g are optional)
Wheel	TABER CS-10F
Power supply	100~240VAC,50/60Hz (not including cleaner)
Power	50W (not including cleaner)

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

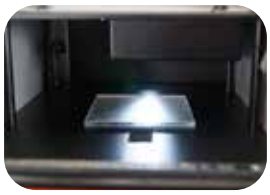
SGH-2
High Precision Hazemeter

Measure the haze of materials.
Standard: *ASTM D1003 Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.*

Vertical hazemeter

High precision

High stability



Brief

The SGH-2 is an intelligent haze meter, applied in haze and visible transmittance measurement of automotive glass, architectural glass, display glass, and other materials, such as EVA, plastic film etc. It has high measuring accuracy and fast speed, and has been calibrated by the NIM in China.

Functions

Visible light haze, Visible light transmittance, Scattered light transmittance.

Parameters

Item	Parameters
Light spot	7±1mm
Illuminant	CIE standard illuminant A
Observer	CIE1931 V (λ)
Haze range	0~30%
Resolution	0.01%
Dimension	400*330*540mm
Accuracy & Repeatability	Range / Accuracy / Repeatability 0~2% / 0.3% / 0.1% 2~10% / 0.5% / 0.1% 10~30% / 2% / 0.1%
Sample size	200*200mm
Power supply	100~240VAC,50/60Hz
Power	100W

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

GlasSmart1000
On-site Optical and Thermal Parameters Measuring System for Insulating Glass

Standards：*ISO 15099*，*ISO10292*，*ISO 9050*

Measure optical & thermal parameters

Directly measure IG

Suit for onsite and lab use

WiFi connection

Brief

GlasSmart1000 is a portable measuring system suitable for on-site measurement of installed building glass. It can quickly measure the glass structure, non-destructive measure U value and SHGC of insulating glass.

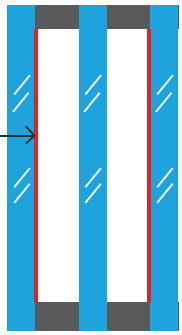
Parameters

Item	Parameters
Light source	Halogen
Wavelength range	300~2500nm
Interface	WiFi
Lithium battery for control box	14.8V/5Ah, charging time is about 4 hours
Lithium battery for T head	14.8V/3Ah, charging time is about 3 hours
Duration working time	3 hours
Measurement time	about 20 minutes
Glass types	installed or un-installed energy saving glass without scattering
Sample thickness	Single pane: 50mm，IG:42mm（6+12A+6+12A+6）
Power supply	DC20V
Working conditions	-10°~40°, < 90%RH

Remark:Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

Measurable Parameters

- Low-E position
- E value



- Visible light transmittance
- Visible light reflectance
- Glass thickness
- Space thickness
- Overall thickness

- Total Solar Energy Transmittance
- Total Solar Infrared Heat Transmittance
- Shading Coefficient
- U vlaue
- LSG

The GlasSmart1000 is developed by Aoptek, which can be calibrated by the China National Institute of Metrology (NIM).

Application

Production verification
Finished glass inspection
Self validating before sending the third party

Glass enterprise

Windoor

Factory inspection
Construction site inspection
Comparison of glass products from different manufacturers

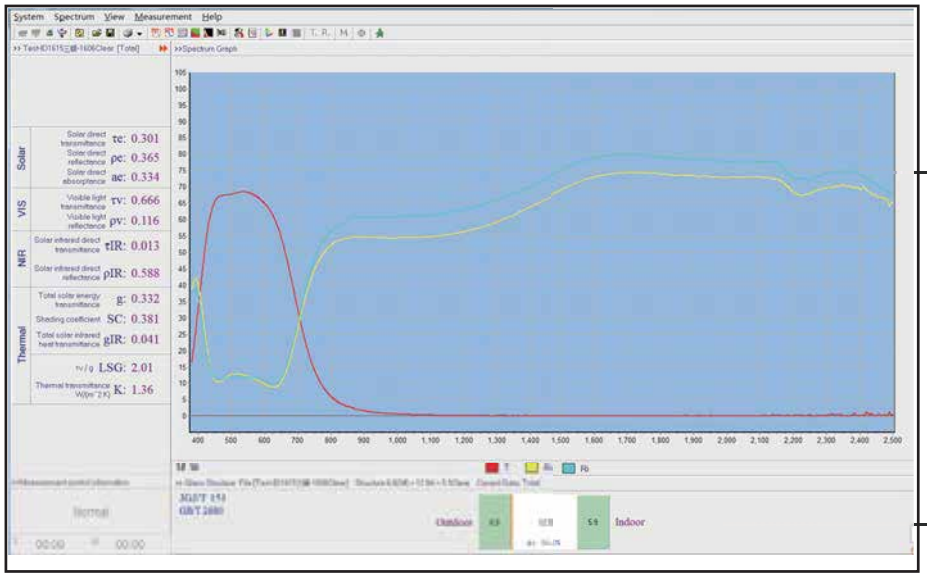
Laboratory inspection
Project site inspection

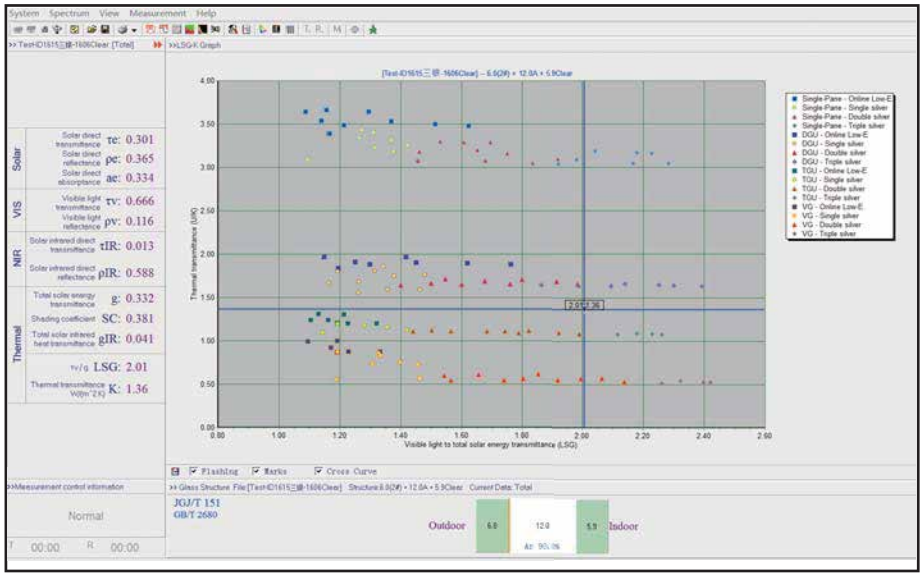
Inspection unit

Construction unit

Construction site inspection
Comparison of different manufacturers
Evaluation of existing windoor & curtain wal

Measurement Interfaces





Characteristics

All basic parameters can be measured, spectrum transmittance & reflectance, thickness, Low-E side, and E value.

All optical and thermal parameters are calculated according to relevant standards.

Nondestructive measurement, directly measure the optical and thermal parameters of IG.

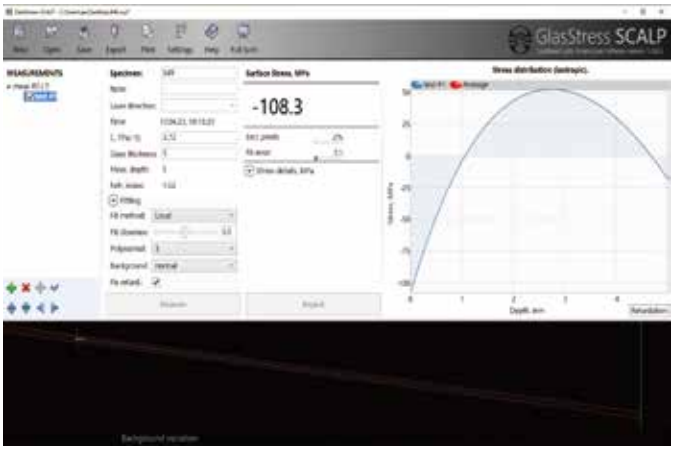
Field measurement, directly measure the installed glass.

Guided measurement, easy to use.

Reliable result, the measurement value can be traced back to NIM.

Lithium battery power supply, suitable for site use.

SCALP-05
Scattered Light Polariscope



Brief

SCALP-05 is a compact scattered light polariscope for depthwise stress measurement in sheet glass. SCALP-05 contains diode laser, optics and camera. Recording of the data and stress calculation is done by PC, connected over USB. Handling of the polariscope is simple – clean the glass, apply a drop of immersion liquid, place SCALP onto the same spot and click the start button in software. After 3 seconds, the stress profile is shown on the screen of PC.

Parameters

Item	Parameters	Item	Parameters
Dimensions (L*W*H)	56*28*76 mm	Minimum measurable thickness	> 1 mm
Weight	177 g	Maximum measurable depth	6 mm (on glass with any thickness)
Communication interface	USB 2.0	Measurement time	1~6 seconds, default 3 seconds
Power supply	USB bus	Minimum surface stress	1 MPa
Power consumption	1.0 W	Maximum stress	Not limited
Laser wavelength	635 nm	Humidity	0 ~90 % R.H. (non-condensing)
Laser output power	5 mw	Ambient light	Direct sunlight must be avoided
Sensor resolution	1280*1024 pixels	Calibration	Calibrated by manufacturer
Software requirements	Windows 10, .NET 4.6	Precision	<1 MPa if surface stress < 4 MPa, <5% otherwise
Measurable glass	Flat and curved glass (r > 300 mm)	Operating conditions	+10 … +50 °C (with some thermal isolation down to -10 °C)
Measurable surface	Air and tin side		

Remark:Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

GlassMeter800K
U Value Meter For IG

Measure thermal transmittance (U/K value).
Standard*: ISO 10292, EN673, JGJ/T 151, ISO 15099, NFRC 100.*

Detect the Low-E side

Measure thickness

E value and U value

Fast measurement

Brief

This instrument is used to directly measure the glass thickness, air space, detect the Low-E side of DGU or TGU,and then calculate the E value and U value , which has the characteristics of portable design, simple operation and fast measurement. It is especially suitable for on-site measurement of installed building glass, doors and windows.

Functions

Nondestructive measure the U value.
Detect the Low-E side, measure the E value.
Measure the thickness of DGU or TGU.

Parameters

Item	Parameters	Item	Parameters
Max thickness of TGU	6+12A+6+12A+6	Min size	200*100*2mm
		Working time	5h
Charging time	3 hours	Battery	ICR 18650
Power supply	5V,2A		
Working conditions	0~40°, ＜ 90% RH	Weight	800g
Dimension	240*135*50mm		
Max allowable error	U value (K value)	±0.1 （U<2.0）	
		±0.2 （U≥2.0）	
	Thickness	±0.1mm（contacted glass）	
		±0.2mm（noncontacted glass or space）	
Restrictions	It can not measure glass with scattering characteristics such as patterned glass, colored glazed glass and frosted glass. The max allowable error is ±0.2mm for the thickness less than 20 mm. Avoid direct sunlight when measuring.		

Remark:Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

OM1
Non-Destructive Sheet Resistance Meter

Contact-free measurement

Non-destructive layers

Built-in rechargeable battery

Fast measurement

Brief

This OM1 is a compact measuring device for the contact-free measurement of sheet resistance of electrically conducting coatings on insulating materials, such as metal-coated glass, plastic films, etc.

Functions

Sheet Resistance (Ohm/sq)

Parameters

Item	Parameters	Item	Parameters
Meas.range	0.5~50 Ohm/sq	Meas. speed	1s
Accuracy	3% (0.5~5 Ohm/sq) 5% (5~20 Ohm/sq) 7%(20~50 Ohm/sq)	Repeatability	1% (0.5~5 Ohm/sq) 2% (5~20 Ohm/sq) 3%(20~50 Ohm/sq)
Working time	6h	Charging time	3h
Battery	ICR 18650	Working conditions	0~40°C, ＜90% RH
Dimension	93*75*75mm	Weight	500g

Remark:Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

BSD-1
Borosilicate Glass Detector

Quickly identify the borosilicate glass

Both samples and installed glass can be measured

Lithium battery built-in

Nondestructive measurement

Brief

This BSD-1 Borosilicate Glass Detector is a device for rapid detection of the borosilicate glass. According to the optical characteristics of borosilicate glass, the device can immediately distinguish borosilicate glass from common float glass without any damage.

Functions

Detect the borosilicate glass or not.

Parameters

Item	Parameters	Item	Parameters
Measuring window	8*18mm	Working conditions	0 °C~40°C ≤90%RH
Power supply	DC5V 2A	Battery	ICR18650
Charging time	3h	Working time	8h
Weight	500g	Dimension	123*97*56 mm

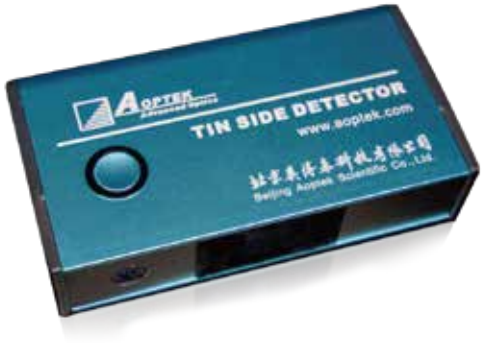
Remark:Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

TS580
Tin Side Detector

“TIN” mark

Easy to detect

Fast detect



Brief

TS580 is used to detect the tin side of float glass. Creative image with text indicator and light filtering technology ensures extraordinary effect. With built-in rechargeable lithium battery, compact and portable features, it is widely applied in glass deep processing industry for tin side detecting. There are three detecting modes, transmission detecting modes, reflection detecting modes and edge detecting modes, it is easy to operate and observe.

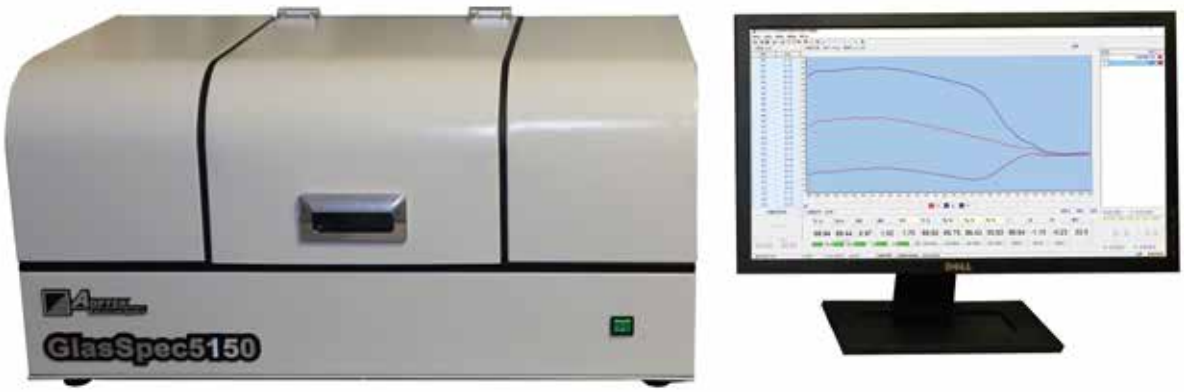
Parameters

Item	Parameters
Working mode	Manual detect
Working time	3h
Power supply	USB DC5V1A
Battery	ICR 18650
Dimension	120×26×70mm
Weight	200g（with battery）

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

GlasSpec5150
Spectrum Transmittance Instrument in Camera Area of Windshields

Measure spectrum transmission of camera area of windshield in special angle.



Brief

This GlasSpec5150 is used to measure the spectrum transmission of the camera area of windshield， and calculate TL, Ta, Tr, Tb, Ts, Tp, RR, BR, PR, Y, x, y, L *, a *, b *, etc. Users can save and print the measured results.

Functions

Visible light transmittance TL, Total transmittance Ta (440-700nm)
Red light transmittance Tr, Blue light transmittance Tb , S light transmittance Ts, P light transmittance Tp
Red light ratio RR, Blue light ratio BR,Polarization ratio PR ， Transmittance color Y, x, y, L *, a *, b *
Traffic signal light transmission chromaticity x, y

Parameters

Item	Parameters	Item	Parameters
Meas. object	Camera area of windshield	Geometric conditions	0°/ 0°
Meas. angle	16°~90°	Wavelength range	380~1000nm
Wavelength Resolution (FWHM)	3~5 nm	Wavelength accuracy	<0.3nm
Wavelength interval	1nm	Spot size	Ø 8
Meas. speed	≤ 5s	Sample size	Min 100*100mm
Cal. method	Zero cal. & 100% cal.	Interface	RJ45
Power supply	220VAC, 50Hz	Power	200W
Repeatability	0.15%	Uncertainty	1.0%
Dimension	700*450*350 mm	Weight	30kg
Working conditions	0 °C~40°C ≤90%RH		

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

SGT-3
Safety Glass Transmittance Instrument

Measure the visible transmittance of automotive glass.
Standard: ISO3538 Road vehicles - Safety glazing materials - Test methods for optical properties.

Automotive glass measurement

Automatic data collection

Printer is built-in

Brief

The SGT-3 is used to measure the visible transmittance of automotive glass. It not only measure small sample, but also measure the large pane of actual automotive windshield, which is suitable for glass production enterprises and research institutes.The instrument is also used to measure the visible light imaging transmittance of other safety glass or laminated glass.

Functions

Visible transmittance.

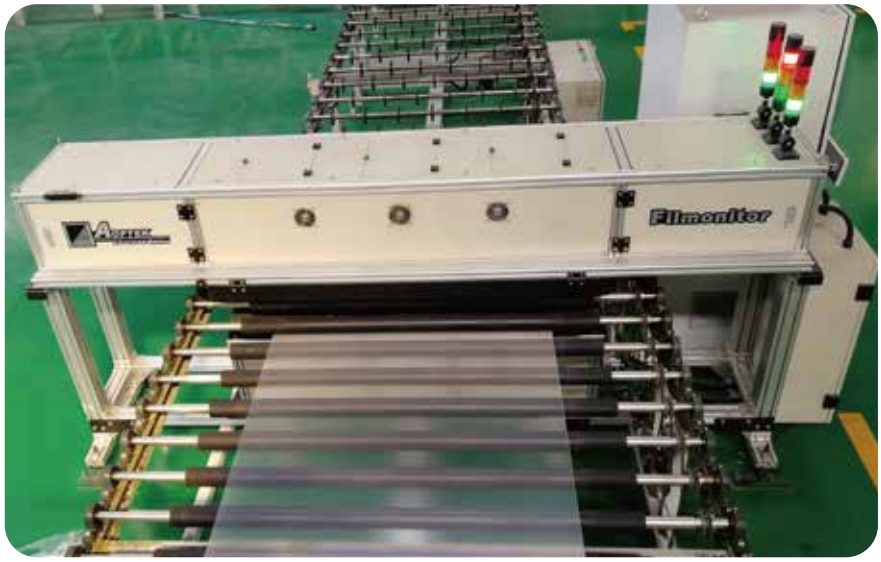
Parameters

Item	Parameters
Geometric conditions	Comply with ISO3538 / GB/T5137.2
Illuminant	CIE standard illuminant A
Observer	CIE1931 V (λ)
Repeatability	0.2%
Accuracy	1%
Sample size	Min: 80*80mm
Dimension	1100*500*830mm
Working conditions	0°C~40°C ≤ 90%RH
Power supply	100~240VAC,50/60Hz
Power	100W
Wight	75kg

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

Filmonitor7120
Online Spectrum Transmittance System

Online Measure Spectrum Transmittance System for AR Coating Line of PV Glass.



Brief

The Filmonitor7120 is an online measuring equipment installed on the solar photovoltaic glass coating production line to measure the spectrum transmittance of anti-reflection coated glass. This measurement system can online measure the spectrum transmittance of solar photovoltaic glass in real time, and calculate the effective transmittance TAM1.5, visible light transmittance Y, x, y, L *, a *, b * of PV coated glass. The measured data will be automatically stored in the database for users to query, compare, and analyse.

Parameters

Item	Parameters	Item	Parameters
Geometric conditions	0° / d	Integrating sphere size	Ø 100
Wavelength range	380~1100nm	Meas. speed	700ms
Glass width	Customized	Glass length	>300mm
Glass edge distance	50mm	T Resolution	0.01%
Meas. repeatability	≤ 0.15%	Meas. reproducibility	≤ 0.15%
Consistency of each Channel	≤ 0.15%	Working conditions	0 °C~40°C ≤ 90%RH
Warm up time	30 minutes	Interface	RJ45
Power supply	220VAC,50Hz	Power	400W

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

Filmeasure2100
Air-Float Spectrum Transmittance Measurement System for PV Glass

Standard: *SEMI PV47-0513 - Specification for Anti-Reflective-Coated Glass, Used in Crystalline Silicon Photovoltaic Modules international standard .*

Brief

The Filmeasure2100 is used to quickly measure the spectrum transmittance of PV patterned glass or PV coating glass or AR coating glass. It can calculate Y, x, y, L *, a *, b *, and TAM1.5. Using the Filmeasure2100, the user can easily measure different several points on a large pane and calculate the average transmittance of these points, so as to control the glass quality.

Characteristics

1. With air-floating, the large pane can be easily moved manually on the measuring table.
2. Directly measure patterned glass without polishing.
3. Automatic dynamic calibration technology, has no drift for a long time.
4. Special optical structure design to eliminate the impact of jitter or ambient stray light.
5. Spectrum curves can be compared before and after coating.
6. Independent software and can upgrade or change control computer freely.

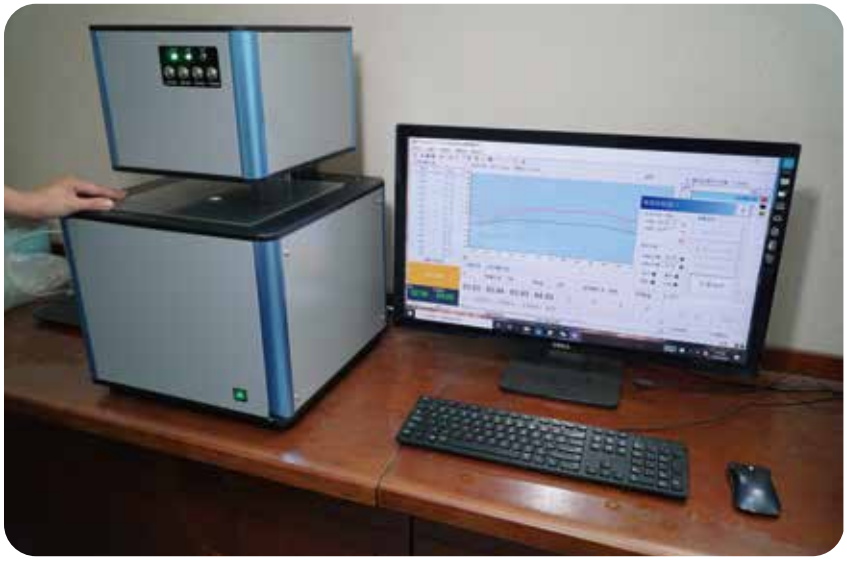
Parameters

Item	Parameters	Item	Parameters
Geometric conditions	0° / d	Interface	RJ45
Integrating sphere size	Ø 100	Meas. speed	≤ 1s
Wavelength range	380~1100nm	Light source	Halogen
Wavelength Resolution (FWHM)	3~5nm	Meas. repeatability	0.1%
Wavelength accuracy	< 0.3nm	Meas. uncertainty	0.3%
Wavelength interval	5nm	Power	1.1KW
Spot size	~ Ø 9	Power supply	220VAC 50Hz
Measuring table size	2200*1200mm	Working conditions	0 °C~40°C ≤ 90%RH
Sample size	Max:2500*1400mm, Min: 100*100mm		
Cal. mode	Automatic or manual	Dimension	2480*1650*1900 mm
Meas. mode	Manual or automatic	Weight	370KG
Output	Effective solar transmittance of photovoltaic glass TAM1.5. Color parameters Y, x, y; L*、a*、b*.		

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

Filmeasure2150
Spectrum Transmittance Instrument for PV Glass

Standard*: SEMI PV47-0513 - Specification for Anti-Reflective-Coated Glass, Used in Crystalline Silicon Photovoltaic Modules international standard .*



Brief

The Filmeasure2150 is used to quickly measure the spectrum transmittance of PV patterned glass or PV coating glass or AR coating glass. It can calculate Y, x, y, L *, a *, b *, and TAM1.5. The Filmeasure2150 can directly measure patterned glass to actually show the original optical performance. The measured results can be stored and printed freely.

Parameters

Item	Parameters	Item	Parameters
Geometric conditions	0° / d	Integrating sphere size	Ø 100
Wavelength range	380~1100nm	Wavelength Revolution (FWHM)	3~5nm
Wavelength accuracy	< 0.3nm	Wavelength interval	5nm
Spot size	~ Ø 9	Measuring table size	420*330mm
Measurable glass size	Max: ≤180 mm from the edge Min: 30*30mm	Cal. mode	Zero Cal. & 100% Cal.
Meas. mode	Manual or automatic	Interface	RJ45
Meas. speed	≤1000ms	Light source	Halogen
Output	Effective solar transmittance of photovoltaic glass TAM1.5. Color parameters Y, x, y; L*、a*、b*.	Meas. repeatability	0.1%
Meas. uncertainty	0.3%	Working conditions	0°C~40°C ≤ 90%RH
Power supply	100~240VAC, 50/60Hz	Power	200W
Dimension	420*420*630 mm	Weight	40KG

Remark: Aoptek reserves the right to modify the information, the actual instrument & manual be as final.

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