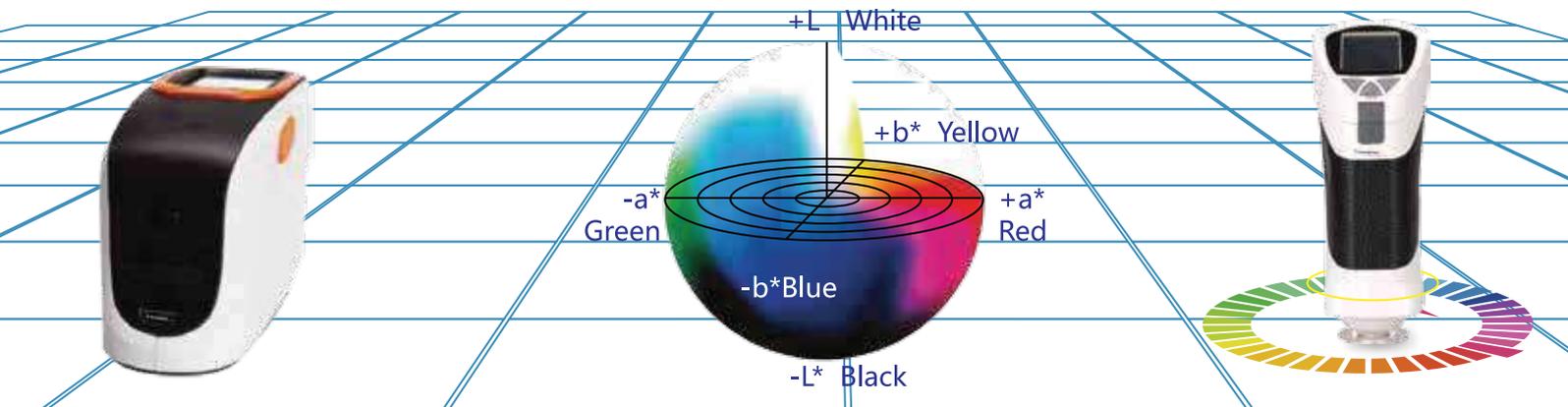
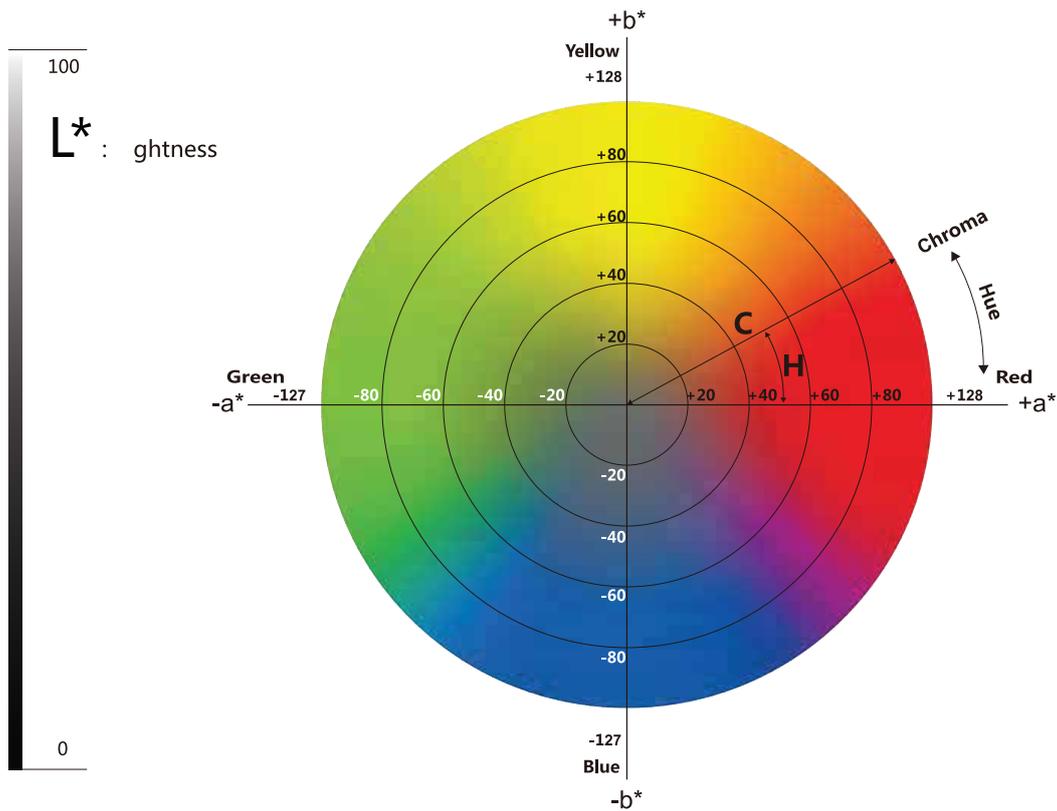


# 3000 Series Color Spectroscopy



EPC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

**Analytical Technologies Limited**

An ISO 9001 Certified Company

[www.analyticalgroup.net](http://www.analyticalgroup.net)

<b>ΔE Value Reference</b>	<b>Color Difference(Tolerance)/Acceptable</b>
<b>0.002</b>	Tiny or no, perfectly mathed
<b>0.2-0.5</b>	Small, acceptable
<b>0.5-1.0</b>	Small to Medlum, acceptable for some industries
<b>1.0-2.0</b>	Medlum, acceptable for specifie industry
<b>2.0-4.0</b>	Large, acceptable for specifie Industry
<b>&gt;4.0</b>	Very Large, unacceptable for most industries

**▼ ΔE color Difference Scale**

$$\sqrt{\Delta E^{*ab+} = (\Delta L^{*})^2 + (\Delta a^{*})^2 + (\Delta b^{*})^2}$$

Δ L+ represents white, Δ L- represents black, Δ a+ represents red, Δ a represents green, Δ b+ means yellow, Δ b- represents blue. When we use CIE\*a\*b\* to show a clor, L\* is balck or whilte. a\* is red or green.b\* is yellow or green.

**▼ CIE LAB**

CIE LAB is color space based on the fact that a color can't be both red and green, or both blue and yellow, because these colors oppose each other. So a single data could be used to describe red/green and yellow/blue. When we use CI EL\*a\*b\* to describe a color, L\* means lightness, a\* means red/green and b\* means yellow/blue.

**▼ CIE LCH**

CIE LCH adopts same color space as L\*a\*b\*, but its L\* represents lightness, c\* represents saturation and h\* represents hue.

# CS-3820

## Transmittance And Reflectance Spectrophotometer



## ▶▶ Product Advantages

### Transmittance and reflectance in one instrument

Transmittance measurement: D/O Geometry (diffuse illumination, 0 degree viewing) to measure liquid APHA, Pt-Co index, Gardner index and other parameter measurement.

### D/8 geometry, simultaneous SCI/SCE measurement

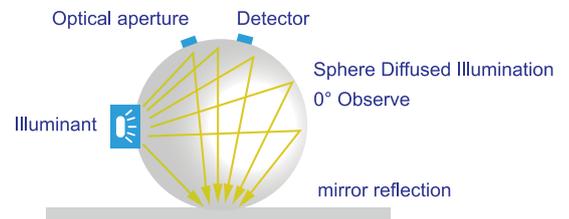
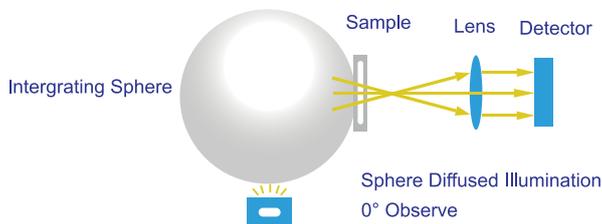
Reflectance measurement: D/8 Geometry (diffuse illumination, 8 degree viewing)

### 4 Testing Calibers

CS-3820 contains 4 kinds of testing calibers and the largest reaches 25.4mm to meet the color measurement requirement for different kinds of materials.

### Double optical path spectrum analysis technology

Simultaneously obtains the sample reflection signal and the light source intensity signal, guarantees the instrument measuring accuracy and the long-term repeatability.



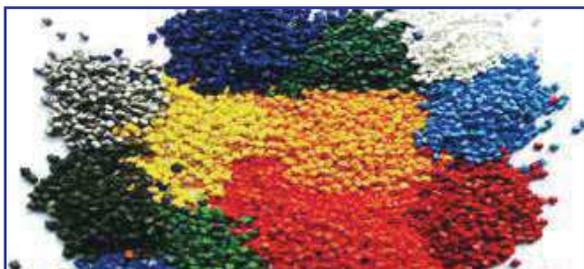
## ▶▶ Application Examples



▲ Liquid



▲ Spraying Industry



▲ Plastic



▲ Building materials

►► **Technical Data**

Type	CS-3820
<b>Illumination / Viewing System</b>	Viewing:2°/10° Reflectance: d/8 (diffused illumination, 8 degree viewing) Simultaneous measurement of SCI /SCE (conforms to CIE No.15, IS07724/1,ASTM E1164,DIN5033 Teil 7, JIS Z8722, Condition c standard)Transmittance: d/0 (diffused illumination, perpendicular reception)
<b>Integrating Sphere</b>	15.2cm, Avian-D Fully diffuse reflective surface coating
<b>Light Source</b>	CLEDs
<b>Detector</b>	Dual optical sensor array
<b>Wavelength</b>	400-700nm
<b>Wavelength Pitch</b>	10nm
<b>Half Band Width</b>	5nm
<b>Reflectance Range / Resolution</b>	0-200% 0.01%
<b>Illuminants</b>	A,C,D50,D55,D65,D75,F1, F2, F3, F4, F5, F6, F7,F8,F9, F10, F11,F12,CWF,U30,DLF,NBF,TL83,TL84
<b>Display</b>	Reflectance graph/value, chromaticity value, color difference values, color assessment results, color tendency, display measurement area, history color value simulation, manual input standard sample, generate measurement reports
<b>Measurement Aperture</b>	Large (LAV):2.54cm (1 inch) Medium (MAV):1.5cm (0.6 inch) Small (SAV):0.75cmx1.01cm (0.3inchx0.4inch) Extra Small (VSAV):0.3 cmx-0.8cm (0.12inchx0.31 inch)
<b>Measurement Time</b>	2s
<b>Color Space</b>	CIE-L*a*b, L*Ct, L*u*v, XYZ, Yxy,Transmittance,Hunterlab, Munsell, MI,CMYK, RGB,HSB
<b>Color Difference Formula</b>	AE*ab, 4E*CH, 4E*uv, 4E*cmc(2:1), 4E*cmc (1:1), 4E*94, AE*00,Eab (Hunter), 555 shade sort
<b>Other Indices</b>	WI(ASTM E313-00, ASTM E313-73,CIE/ISO, AATCC, Hunter, Taube, Berger Stensby), YI(ASTM D1925,ASTM E313-00, ASTM E313-73), Tint(ASTM E313-00, CIE, Ganz), Metamerism index Milm, staining fastness, color fastness, APHA, Pt-Co Index, Gardner, ISO Brightness, Saybolt, ASTM color, Haze.

<b>Repeatability</b>	Standard deviation within 0.08%; Chromaticity value: $\Delta E^*ab$ 0.015 (When a white calibration plate is measured 30 x at 5-second intervals after white calibration), max. 0.03
<b>Inter-instrument agreement</b>	Within $\Delta E^*ab$ 0.2 (BCRA Series II, average measurement of 12 color charts)
<b>Interface</b>	USB
<b>Power</b>	117VAC/50-60Hz, 230VAC/50-60Hz
<b>Size</b>	583*330*304mm ( L*W*H )
<b>Operation Temperature</b>	15°C-32°C (60°F-90°F) <span style="float: right;">n</span>
<b>Working Temperature</b>	0-45°C, relative humidity 80% or below (at 35°C); no condensation

# CS-3810

## Transmittance Spectrophotometer



### ▶▶ Product Advantages

#### Glass and Liquid Color Measurement

Transmitted Spectrophotometer is a spectrophotometer of high-performance which is technically designed to measure the transmittance, absorbency, concentration and Chroma of the materials. The instrument uses D/0 measurement structure and integrates many technologies including light source that has balanced intensity across visible spectrum, the double grating and double optical path splitting system and ETC (Every Test Calibration), which makes the instrument reach a resolution of 0.0001, the standard deviation of the transmittance's repetitiveness in 0.08% and the standard deviation of the chromatic value's repetitiveness is  $\Delta E^*ab$  0.015

### Adopts CLEDs illuminant

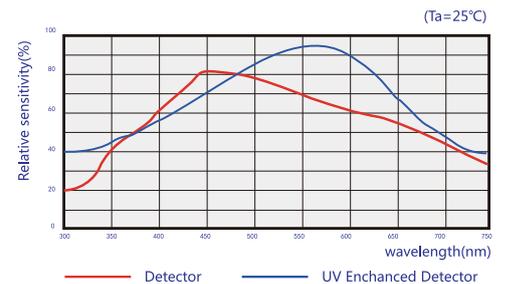
Full-band balanced light source which ensures adequate spectral distribution in the visible range, to avoid the spectral loss of white LED in a particular band, improve the measurement speed and results accuracy.

### Every Test Calibration

The standard white board is inside the optical system for has reliable accuracy and repeatability in each test.

### Usage of UV-enhanced Silicon Photodiode

Transmittance measure range improved from 0-100% to 0-200%



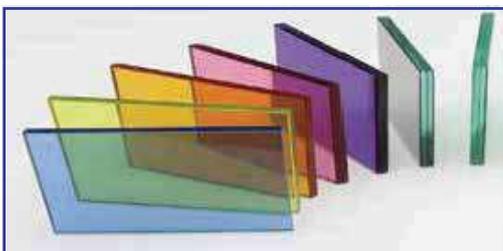
## ▶▶ Application Examples



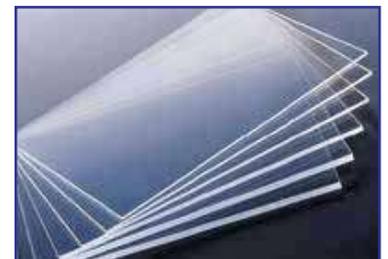
▲ Clear liquid



▲ Solvent



▲ Glass



▲ Transparent Plastic

►► **Technical Data**

Type	CS-3810
<b>Illumination / Viewing System</b>	Viewing Degree:2°and 10° Niewing Illumination: d/0 (diffuse Illumination, 0 degree viewing) (conform to CIE No.15, ISO 7724/1, ASTM E1164, DIN 5033 Teil7, JIS Z8722, Condition c standard)
<b>Integrating Sphere Illumination</b>	40mm, Avian-D Fully diffuse reflective surface coating
	CLEDs
<b>Detector</b>	Dual optical sensor array
<b>Wavelength</b>	400-700nm
<b>Wavelength Pitch</b>	10nm
<b>Half Band Width</b>	5nm
<b>Reflectance Range / Resolution</b>	0-200% 0.01%
<b>Light Source</b>	A,C,D50,D55,D65,D75,F1, F2, F3, F4, F5, F6, F7,F8,F9, F10, F11,F12,CWF,U30,DLF,NBF,TL83,TL84
<b>Display</b>	Reflectance graph/value, chromaticity value, color difference values, color assessment results, color tendency, display measurement area, history color value simulation, manual input standard sample, generate measurement reports
<b>Measurement Interval</b>	2s
<b>Measurement Time</b>	0.5s
<b>Measurement Caliber</b>	25.5*10mm (cuvette support)
<b>Color Space</b>	CIE-Va*b, L*C*h, L*u*v, XYZ, Yxyl Transmittance,Hunterlab, Musell, MI, CMYK
<b>Color Difference Formula</b>	AE*ab, AE*CH, 4E*uv, 4E*cmc(2:1), AE*cmc(1:1), 4E*94, AE*00, Eab (Hunter), 555 shade sort
<b>Other Indicators</b>	WI (ASTM E313-00,ASTM E313-73,CIE/ISO,AATCC, Hunter,Taube Berger Stensby),YI(ASTM D1925, ASTM E313-00,ASTM E313-73),Tint(ASTM E313, CIE,Ganz)Metamerism index Milm,staining fastness, color fastness,APHA,Pt-Co Index,Gardner,Saybolt, Astm color
<b>Repeatability</b>	Transmittance, standard deviation within 0.08% Chromaticity value: AE*ab 0.015 (When a white calibration plate is measured 30 x at 5-second intervals after white calibration), max. 0.03

<b>Inter-instrument agreement</b>	Within $\Delta E^*ab$ 0.2
<b>Data Storage</b>	Mass storage (PC)
<b>Interface</b>	USB
<b>Light source lifetime</b>	5years, 1.5 million tests
<b>Size</b>	475*340*150mm ( L*W*H )
<b>Working Temperature</b>	0-45°C,relative humidity 80% or below (at 35°C) no condensation
<b>Standard Accessories</b>	AC power line, color QC software, driving software, USB Accessories cable, black calibration tile, 40x10 cuvette

# CS-3800

## Top-port Spectrophotometer



### ▶▶ **Product Advantages**

#### **The First Bench-top Spectrophotometer in India**

CS-3800 is the first bench-top spectrophotometer in China to make up for the corresponding domestic market vacancies. Over the years, its accuracy and performance make great improvement, and now has a huge market.

#### **D/8 geometry, Simultaneous SCI/SCE measurement**

Adopt international D/8 geometry (Integrating sphere diffused illumination, 8 degree viewing)  
 Simultaneous measurement of SCI/SCE compatible with lighting observation conditions.

## Top-port Caliber for Color Measurement



Adopt geometric conditions of D/8 illumination and viewing with upward testing caliber which is easier for testing all kinds of samples. Solid samples (steel, cloth) can be placed directly on the measurement caliber, particles (tablets, master batch), powder (Calcium Carbonate, pigment, coffee), paste objects (tomato sauce) can be placed in a cuvette, then placed in the caliber.

### ▶▶ Application Examples



▲ Opaque liquid



▲ Powder



▲ Pellet



▲ Paste

### ▶▶ Technical Data

Type	CS-3800
<b>Illumination / Viewing System</b>	Illuminant: d/8 (diffused illumination, 8 degree viewing) Simultaneous measurement of SCI (Specular Component Included) /SCE (Specular Component Excluded)(conforms to CIE No.15, IS07724/1,ASTM E1164,-DIN5033 Teil 7, JIS Z8722, Condition c standard)
<b>Integrating Sphere Illumination</b>	40mm, Avian-D Fully diffuse reflective surface coating
	CLEDs
<b>Detector</b>	Dual optical sensor array
<b>Wavelength</b>	400-700nm
<b>Wavelength Pitch</b>	10nm
<b>Half Band Width</b>	5nm
<b>Reflectance Range / Resolution</b>	0-200%
	0.01%
<b>Light Source</b>	A,C,D50,D55,D65,D75,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10, F11,F12,CW-F,U30,DLF,NBF,TL83,TL84

<b>Display</b>	Reflectance graph/value, chromaticity value, color difference values, color assessment results, color tendency, display measurement area, history color value simulation, manual input standard sample, generate measurement reports
<b>Measurement Interval</b>	1s
<b>Measurement Caliber</b>	Φ11mm
<b>Color Space</b>	CIE-L*a*b,L*C*h,L*u*v, XYZ, Yxy, Reflectance, Hunterlab, Munsell MI, CMYK, RGB,HSB
<b>Color Difference Formula</b>	AE*ab,AE*CH,AE*uv,AE*cmc(2:1),AE*cmc(1:1),AE*94,AE*00,Eab (Hunter),555 shade sort
<b>Other Indicators</b>	WI(ASTM E313-10,ASTM E313-73,CIE/ISO,AATCC,Hunter, Taube Berger,Ganz,Stensby),YI(ASTM D1925,ASTM E313-10, ASTM E313-73),Tint(ASTM E313,CIE,Ganz),Metamerism index Milm , staining fastness, color fastness, ISO brightness, 8 Glossiness, A Density, T Density,E Density,M Density
<b>Repeatability</b>	Reflectance: standard deviation within 0.08% Chromaticity value: Standard deviation within AE*ab 0.015 (When a white calibration plate is measured 30 x at 5-second intervals after white calibration), max. 0.03
<b>Inter-instrument agreement</b>	Within AE*ab 0.2 (BCRA Series II, average measurement of 12 color charts)
<b>Battery Power</b>	chargable, 20000 continuous tests, 7.4V/6000mAh
<b>Interface</b>	USB
<b>Light source lifetime</b>	10 years, 3 million tests
<b>Working Temperature</b>	0-45°C,relative humidity 80% or below (at 35°C); no condensation
<b>Accessories</b>	AC power line, operating manual, color QC software, driving software, electric operating manual, USB cable, white/black calibrationtile, verification certification Optional: powder presser, cuvette with diameter 29mm, cover
<b>Color Matching Software</b>	Workable
<b>UV Light Source</b>	Without

# CS-3801

## Sideward Spectrophotometer



### ►► Product Advantages

D/8 geometry, Simultaneous SCI/SCE measurement Adopt international D/8 geometry (Integrating sphere diffused illumination, 8 degree viewing) Simultaneous measurement of SCI/SCE compatible with lighting observation conditions.

#### **Sideward Caliber for Color Measurement**

With sideward testing caliber, it is suitable for fix the samples. Solid sample (cloth) can be placed directly on the testing caliber. Powder material and pasty material need to be held by cuvette and then put on the testing caliber. Sideward testing caliber can prevent the scattered powder into the integrating sphere, affecting the test accuracy.

#### **Flexible Fixture**

Samples with different thickness and sizes can be fixed on the testing caliber to in case of light entering into the instrument to affect the testing accuracy.

►► **Application Examples**



▲ Open the fixture



▲ Tablets made by powder



▲ Paper



▲ Solvent

►► **Technical Data**

Type	CS-3801
<b>Illumination / Viewing System</b>	Illuminant: d/8 (diffused illumination, 8 degree viewing) Simultaneous measurement of SCI (Specular Component Included) /SCE (Specular Component Excluded) (conforms to CIE No.15, IS07724/1, ASTM E1164, DIN5033 Teil 7, JIS Z8722, Condition c standard)
<b>Integrating Sphere Illumination</b>	40mm, Avian-D Fully diffuse reflective surface coating
	CLEDs
<b>Detector</b>	Dual optical sensor array
<b>Wavelength</b>	400-700nm
<b>Wavelength Pitch</b>	10nm
<b>Half Band Width</b>	5nm
<b>Reflectance Range / Resolution</b>	0-200%
	0.01%
<b>Light Source</b>	A, C, D50, D55, D65, D75, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, CWF,U30, DLF, NBF, TL83, TL84
<b>Display</b>	Reflectance graph/value, chromaticity value, color difference values, color assessment results, color tendency, display measurement area, history color value simulation, manual input standard sample, generate measurement reports

<b>Measurement Interval</b>	1s
<b>Measurement Caliber</b>	Φ11mm
<b>Color Space</b>	CIE-L*a*b,L*C*h,L*u*v, XYZ, Yxy, Reflectance, Hunterlab, Munsell MI, CMYK, RGB,HSB
<b>Color Difference Formula</b>	AE*ab,AE*CH,AE*uv,AE*cmc(2:1),AE*cmc(1:1),AE*94,AE*00,Eab (Hunter),555 shade sort
<b>Other Indicators</b>	WI(ASTM E313-10,ASTM E313-73,CIE/ISO,AATCC,Hunter, Taube Berger,Ganz,Stensby),YI(ASTM D1925,ASTM E313-10, ASTM E313-73),Tint(ASTM E313,CIE,Ganz),Metamerism index Milm , staining fastness, color fastness, ISO brightness, 8 Glossiness, A Density, T Density, E Density,M Density
<b>Repeatability</b>	Reflectance: standard deviation within 0.08% Chromaticity value: Standard deviation within AE*ab 0.015 (When a white calibration plate is measured 30 x at 5-second intervals after white calibration), max. 0.03
<b>Inter-instrument agreement</b>	Within AE*ab 0.2 (BCRA Series II, average measurement of 12 color charts)
<b>Battery Power</b>	chargable, 20000 continuous tests, 7.4V/6000mAh
<b>Interface</b>	USB
<b>Light source lifetime</b>	10 years, 3 million tests
<b>Working Temperature</b>	0-45°C,relative humidity 80% or below (at 35°C); no condensation
<b>Accessories</b>	AC power line, operating manual, color QC software, driving software, electric operating manual, USB cable, white/black calibration tile, verification certification Optional: powder presser, cuvette with diameter 29mm, cover
<b>Color Matching Software</b>	Workable
<b>UV Light Source</b>	Without

# Spectrophotometer



## ▶▶ Application

Plastic Color Measurement

Textile Color Measurement

Food Color Measurement

Paint Color Measurement

Build-in Pantone Color Charts Database

Pantone Color Number Matching

## ▶▶ Product Advantages

SCS Optical Engine



Adopt innovative single-grating-dual-light-paths light splitting system SCS optical engine which creates the best measurement repeatability for portable spectrophotometers and guarantees accurate measurement of materials surface color.



### Camera To See The Measurement Area

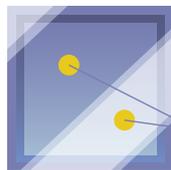


In previous measurement instrument, we can only aim at the testing area approximately, and it may introduce errors. Our new spectrophotometers include a camera, so the user can clearly see the testing area to avoid measurement errors.

### Automatic Gloss Compensation Technology



Different gloss or different instrument's light source or observe angles greatly affects the measurement of color. The automatic gloss compensation technology guarantees the accuracy of color measurement data for surfaces of different gloss. This research finding is published in international leading SCI included journal Optik.



The same color in different gloss will lead to different measured data.

### Every Test Calibration Technology



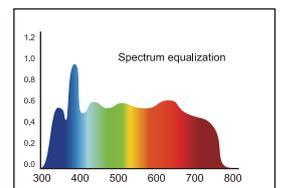
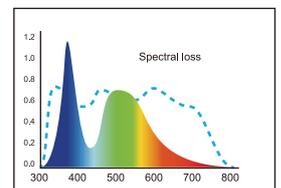
Currently, most instruments use standard white boards for calibration. When white board is damaged, the instrument's accuracy or precision can not be guaranteed. In CHNSpec's spectrophotometers, it uses innovative ETC(Every Test Calibration); standard white board is included in the optical system, and therefore has reliable accuracy and repeatability for every measurement.



### Adopt Cleds Light Source Spectrally Balanced Led Light Source



LED light source has balanced intensity across visible spectrum avoids the spectral deficiency in certain parts of the spectrum in common white LEDs, which guarantees the speed and accuracy of the measurement results. This research has been published in national leading optical journal Optics Letter.



## Pantone Color Number Matching



To improve the utility and convenience of our instrument, we develop spectrophotometer with build-in pantone color swatches. After measurement, we could see the color reference number on the screen.



### ▶▶ Application Examples



▲ Paint



▲ Plastic



▲ Textile



▲ Printing

### ▶▶ Technical Data

Type	CS-3580	CS-3600	CS-3610	CS-3650	CS-3660
<b>Illumination</b>	D/8 ( Diffused illumination, 8° viewing ) SCS optical engine ( light splitting and integration system ) , ETC ( real time calibration technology ) , SCI ( specular component included ) /SCE ( specular component excluded ) simultaneous measurement. ( conform to CIE No.15, ISO 7724/1, ASTM E1164, DIN 5033 Tei17, JIS Z8722 Condition c standards )				
<b>Illumination Light Source</b>	CLEDs(entire wavelength balanced LED light source)			pulse xenon lamp	CLEDs
<b>Wavelength Range</b>	400-700nm			360-740nm	400-700nm
<b>Measurement light source</b>	A, C, D50, D55, D65, D75, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, CW-F, U30, DLF, NBF, TL83, TL84, U35				
<b>Data being displayed</b>	SPD distribution/data, sample's color values, color difference values / graph, pass/fail results, color error tendency, color simulation, display measurement area, history data color simulation, manual input standard sample, generate measurement report				
<b>Measurement time</b>	2 second				

<b>Measurement time interval</b>	2 second	0.5 second	0.5 second	2 second	0.5 second
<b>Color Differences</b>	CIE-L*a*b,L* C*h, L*u*v, XYZ,Yxy, Reflectance	CIE-Va*b,L*C*h,L*u*v,XYZ,Yxy,Reflectance,Hunter-lab, Munsell MI,CMYK,RGB,HSB			
<b>Color Spaces</b>	AE*ab,AE*CH, AEuv, AE*cmc (2:1), AE*cmc (1:1), AE*94, AE*00	AE*ab,AE*CH,AE*uv,AE*cmc(2:1),AE*cmc(1:1),AE*94, AE*00,AEab(Hunter),555 shade sort			
<b>Repeatability</b>	Reflectance: Standard Deviation Within 0.08%				
	chromaticity value: AE*ab < 0.03(when a white calibrate plate is measured 30 x at 5-second intervals after white calibration),Maximum: 0.05	chromaticity value: AE*ab <=0.02 (when a white calibr- ate plate is measured 30 x at 5-second intervals after white calibrati- on), Maximum : 0.04	chromaticity value: AE*ab < 0.015 (when a white calibrate plate is measured 30 x at 5-second intervals after white calibration), Maximum: 0.03		
<b>Battery Capacity</b>	Chargable, 10000 continuous tests, 7.4V/6000mAh USB	Chargable, 20000 contin- uous tests, 7.4/6000mAh USB	Chargable, 10000 continuous tests, 7.4/6000mAh USB		
<b>Interface</b>	USB		USB, bluethooth (optional) 40000 test results		
<b>Data storage</b>	20000 test results		40000 test results		
<b>Light source lifetime</b>	5 years, 1.5 million tests	10 years, 3 million tests			
<b>Inter-instrument agreement</b>	$\Delta E^* ab$ within 0.2 (BCRA color charts II, average of the 12 charts)				

<b>Working temperature</b>	0~45°C, relative humidity 80% or below (at 35°C), no condensation		
<b>Color matching system</b>	does not match	matches	
<b>UV light source</b>	Excluded	Included	Excluded

## Spectral Colorimeter



### ►► Features

**Highest Precision Colorimeter**

**Adopt spectral measurement theory for high accuracy**

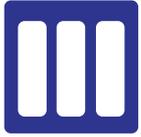
**Patented Technology for stability**

**Optional accessories for different functions**

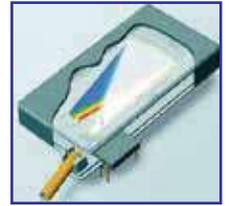
**Obtain National Metrology Certification**

## ▶▶ Product Advantages

### SCS Optical Engine



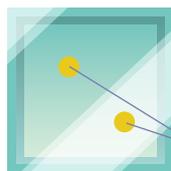
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### Every Test Calibration Technology



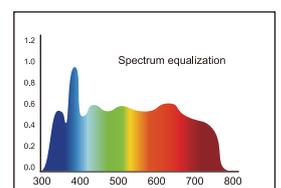
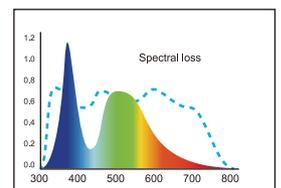
Currently, most instruments use standard white boards for calibration. When white board is damaged, the instrument's accuracy or precision can not be guaranteed. In CHNSpec's spectrophotometers, it uses innovative ETC(Every Test Calibration); standard white board is included in the optical system, and therefore has reliable accuracy and repeatability for every measurement.



### Adopt Cleds Light Source Spectrally Balanced Led Light Source



LED light source has balanced intensity across visible spectrum avoids the spectral deficiency in certain parts of the spectrum in common white LEDs, which guarantees the speed and accuracy of the measurement results. This research has been published in national leading optical journal Optics Letter.



▶▶ **Product Details**



▶▶ **Application Examples**



▲ Plastic



▲ Paint



▲ Printing



▲ Food

▶▶ **Technical Data**

Type	CS-3280	CS-3280+	CS-3286	CS-3228
<b>Illumination</b>	di/8(diffuse illumination: 8°viewing),SCI (conform to CIE No.15,ISO 7724/1,ASTM E1164,DIN 5033 Teil7,JIS Z8722 Condition c standard)			
<b>Illumination Sphere Size</b>	Φ40mm,Avian-diffused reflection surface coating			
<b>Illumination Source Size</b>	CLED			
<b>Sensor</b>	Array Sensor			
<b>Wavelength Range</b>	400-700nm			
<b>Spectral Resolution</b>	10nm			
<b>Measurement time</b>	2s			

<b>Measurement Aperture</b>	11 mm, optional 4mm, 6mm, 15mm		
<b>Repeatability</b>	Standard Deviation $\Delta E^*ab$ 0.08(When a white calibration plate is measured 30 x at 10-second intervals after white calibration)		
<b>Observers</b>	2° and 10°		
<b>Light Source</b>	A,C,D50,D65	A,C,D50,D55,D65,D75,F1—F12, CWF,U30,DLF,NBF, TL83,TL84,U35	
<b>Display</b>	Chromaticity value ( $L^*a^*b$ , $L^*C^*h$ ), delta E value, pass/fail, color tendency, average,generate test report,spectrum reflectance figuret		
		with camera	with camera, spectrum reflectance figure, manually input target sample
<b>Color Differences</b>	$\Delta E^*ab, \Delta E^*CH$		$\Delta E^*ab, \Delta E^*CH, \Delta E^*cmc(2:1), \Delta E^*cmc(1:1), \Delta E^*94, \Delta E^*00$
<b>Color Spaces</b>	CIE- $L^*a^*b$ , $L^*C^*h$	CIE- $L^*a^*b$ , $L^*C^*h$ , XYZ,Yxy	CIE- $L^*a^*b^*$ , $L^*C^*h$ , $L^*u^*v$ ,XYZ, Yxy,Reflectance
<b>Other Index</b>	WI(ASTM E313 -10,ASTM E313 -73,CIE/ISO,AATC-C,Hunter,Taube Berger,Ganz,Stensby) YI(ASTM D1925,ASTM E313 -00,ASTM E313 -73) Tint(CIE,ASTM E313,Ganz)		
			metameric index Milm,staining fastness,color fastness
<b>Light Source Lifetime</b>	5 years,1.5 million		
<b>Other</b>	without camera,electricity pantone color chart		camera,electricity pantone color chart,Mobile Phone APP
<b>Display</b>	Panchromatic true color screen		
<b>Language</b>	English		
<b>Interface</b>	USB2.0		
<b>Working Temperature</b>	5-45°C relative humidity 80% or less(at 35°C) with no condensation		
<b>Storage Temperature</b>	-25°C to 55°C,relative humidity 80% or less (at 35°C) with no condensation		

<b>Power</b>	Chargable Lithium Battery 8.4V/2000mAh, adaptor DC12V
<b>Size</b>	77x86x210mm
<b>Weight</b>	about 550g
<b>Standard Accessories</b>	AC Adapter, Operating Manual, Color QC Software, Driving Software, USB Cable, Calibration Tiles (Black and White), Protection Cover, Canvas bag
<b>Optional</b>	Micro Printer
<b>Color Matching System</b>	not matching
<b>UV Light Source</b>	excluded



**CS-3010**

Best Choice For Low Price



**CS-3200**

High Quality &  
Reasonable Price



**CS-3260**

Color Number Matching



**CS-3210**

Camera View



**CS-3220**

Power Measurement

National Metrology Accreditation

Camera for Viewing Measurement Area

English Language Switching

Design for Powder and Pasty Material

Mass Storage Memory

Color Number Matching

▶▶ **Product Advantages**



**CS-3010**

**Best Choice For Low Price**

CS-3010 is the cheapest colorimeter designed for assembly line. It could meet most color measurement requirement with high accuracy.



**CS-3200**

**Cost-effective**

CS-3200 is the update version for CS-10 for the improvement of testing accuracy and measuring YI and WI. It belongs to high cost-effective product.



**CS-3210**

**Camera View**



CS-3210 is with build-in micron camera for viewing the measuring area. It is convenient for customer to see the measuring area and suitable for testing patterned and colorful samples.



**Power Measurement**

**CS-3220**



CS-3220 provides specular component excluded (SCE) measuring condition. It is designed for the color measurement of powder, pasty materials and highly reflective materials.





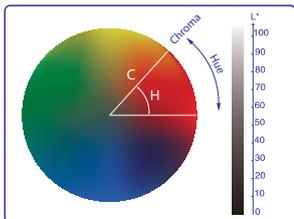
**CS-3260**



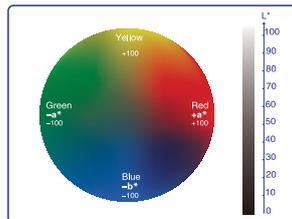
### Color Number Matching

CS-3260 is with build-in color charts. After measurement, instrument will match three color numbers from the color charts for the colourist reference.

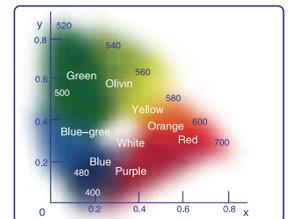
### ▶▶ Multiple Color Spaces



CIE L\*c\*h Color Space



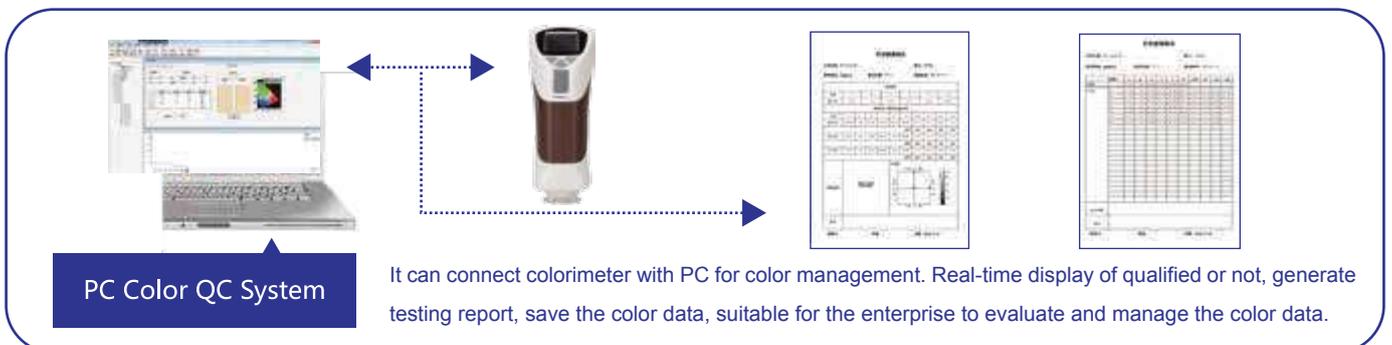
CIE L\*c\*h Color Space



Yxy Color Space

Being the most commonly used testing device, our colorimeter with color display indicators transformation program that makes our device could be used for color measurement in many different industries. It does not need convert the measurement data by manual which greatly improve the work efficiency.

### ▶▶ PC Software



►► **Technical Data**

Type	CS-3010	CS-3200	CS-3210	CS-3220	CS-3260
<b>Optical System</b>	8/d (8° illumination angle/diffuse viewing) SCI (specular component included)			8/d , SCE	8/d , SCI
<b>Display Mode</b>	Chromativity Value: L*a*b,L*C*h,ΔE*ab,xyz,Yxy with respect to RGB; Color Difference:ΔE*ab,ΔE*Ch				
	Whiteness: Hunter Whiteness, Ganz Whiteness; Yellow: YI				
<b>Measuring Aperture</b>	Φ8mm				
<b>Measuring Condition</b>	CIE 10° standard observer/CIE D65 light source				
<b>Measuring Angle</b>	L* : 1~100				
<b>Repeatability</b>	Standard deviation within ΔE*ab<0.1 (measuring condition: measuring white calibration board 30 times)		Standard deviation within ΔE*ab<0.08 (measuring condition: measuring white calibration board 80 times)		
	10 samples and 100 data groups for each sample				
<b>Storage Capacity</b>	100 samples and 100 data groups for each sample				
<b>Measurement Time</b>	0.5s				
<b>Light Source</b>	LED				
<b>Interface Language</b>	English				
<b>Power Supply</b>	Four 1.5V AA-sized alkaline battery or nickel metal hydride batteries/DC5V				
<b>Interface</b>	USB 2.0, Printer				
<b>Weight</b>	550g				
<b>Volume</b>	77x86x210mm				
<b>Other Functions</b>			Camera View	Pasty Material Measurement	Color card look-up function

# Gloss Meter CS-3000/3800



## ▶▶ **Product Advantages**

### **High Precise**

Every instrument has verification certificate from National Modern Metrology and Instruments Testing Laboratory.

### **Comfortable Grab Feeling**

The shell is made by Dow Cornig TISLV material, a desirable elastic material. It is resistant to UV and bacteria and does not cause allergy. All desing are for better user experience

### **High Stability**

Every gloss meter made by us has done the following tests:

412 calibration tests

43200 stability tests

110 hours of accelerated aging test

17000 vibration tests

### **Large Battery Capacity for 50000 continuous tests**

We fully utilize every space of the device and specially custom made advanced high density lithium battery which ensures continuous testing for 54300 times.

## ▶▶ Application Examples



◀ Automobile accessories



◀ Metals



◀ Ceramic tile



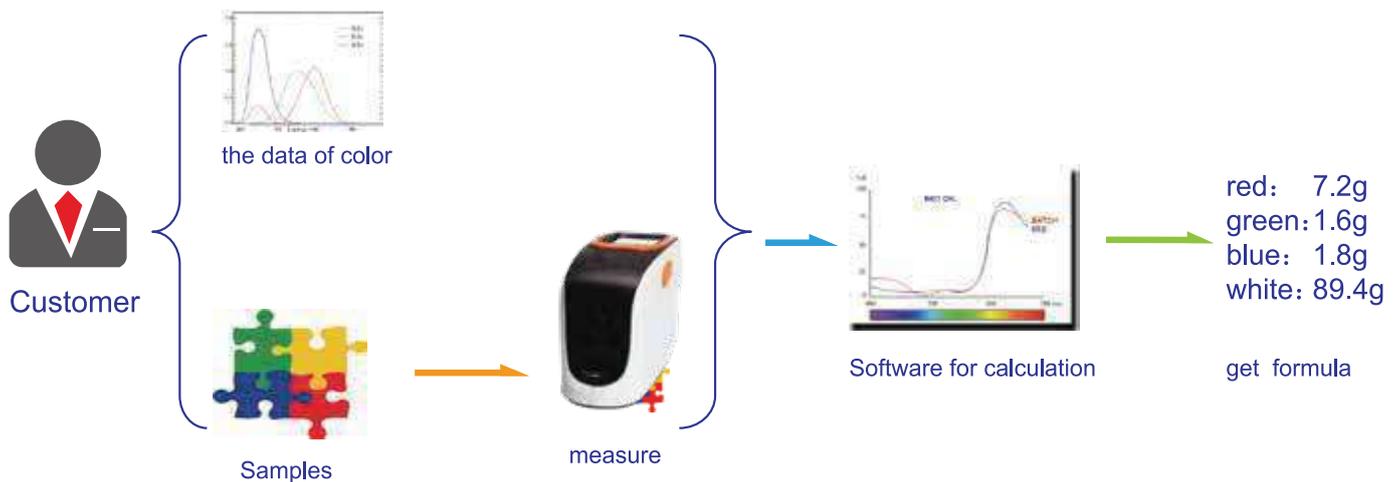
◀ Glass

## ▶▶ Technical Data

Type	CS-3380	CS-3300
Measurement Angles	20°, 60°, 85°	60°
Measurement Light Spot(mm)	20° : 10°, 10° 60° : 9*15 85° : 5*38	60°: 9*15
Measurement Range	20° : 0-2000GU 60° : 0-1000GU 85° : 0-160GU	60°: 0-1000GU
Measurin Mode	0-100: 0.10GU	>100: 1GU
Stability	simple mode and statsitics mode	
Measurement Repeatability	0-100GU:0.2GU	100-2000GU:0.2%GU
Measurement Standard	conform to JJG 696 standard for first class gloss meters	
Measurement time	less than 1s	0.5s
Storage Memory	100 pcs standards; 1000 pcs samples	
Size: (L*W*H)	165*51*77mm	
Weight	about 400g	
Language	English	
Battery Capacity	3000mAh Lithium Battery	
Interface	USB,Bluetooth(optional)	
Working Temperature	0-40°C	
Humidity	<85%, no condensation	
Accessory	5V/2A charger, USB cable, operating manual, software CD, calibration tile, verification certification	

## Paint and printing Ink Color Matching system

### Color Matching system



● **PAINT**

● **COATING**

● **INK**

● **PRINTING**

CHNSpec's Color Matching System	Artificial Color Matching
Provide various of formula according to the instrument testing result	The chemist could only provide limited color scheme
Color value and formula data reduce labor cost and ensure stable production	The color scheme is not stable and entirely depends on the experience of chemist
Simple operation and repaid result	Complicated and requires experienced chemist for long time matching
Get electronic sample value and formula data	Color chart and formula can not be recorded well
Formula is higher accuracy and increasing the efficiency of chemist	Chemist need adjust formula for many times. It spends longer time, increasing the cost and reduces efficiency
Old and waste material can be used for color matching which saves cost	A large number of waste and old materials can not be fully used

## Color Swatch and Light Box

### Pantone Color Swatch

Pantone C/U Color Swatch includes 644 kinds of new colors which added in 2010. In 2015, new color chart adds blusher, pink, blue, green and purple. Designer or printing workers can use it for sparking inspiration.



## Light Box



Light box is also called light booth or color matching cabinet. It is the illuminant for checking the samples color difference. After connect with power, press the illuminant button, the corresponding light will be switched on. Then we could compare the samples color inside it. Multi light sources could be chosen at the same time. Customer could choose the suitable light source according to his or her need and the most commonly used light source is D65.

### Four/Five/Six Illuminations Color Light Box

Low power consumption, no heat producing, high efficiency, small volume, simple operation, low cost, configuration.

### 1200L Six Illuminations Color Light Box

Six Illuminations Color Light Box contain 6 kinds of illuminations: D65, TL84, CWF, UV, U30 and F/A.

▶▶ Regulatory compliances



▶▶ Corporate Social Responsibility

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