

# SPECTROPHOTOMETER BENCHTOP



**DS-36D Repeatability 0.01  
Inter-Instrument Agreement 0.18**



**DS-39D Repeatability 0.005  
Inter-Instrument Agreement 0.08**



## DS-D SERIES



**DS-37D Repeatability 0.005  
Inter-Instrument Agreement 0.12**



# BENCHTOP SPECTROPHOTOMETER

## DS-D SERIES

There are three models available:

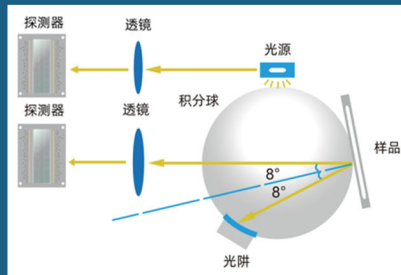
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 DS-37D Repeatability 0.005 Inter-Instrument Agreement 0.12  
 DS-39D Repeatability 0.005 Inter-Instrument Agreement 0.08

- Two types of lamps: pulse xenon and LED
- 37 standard light sources, 40+ measurement indicators
- Automatic recognition of four apertures switching
- Temperature and humidity calculation compensation function
- 7-inch touch screen, Android operating system

- Provide powerful ColorExpert computer data management software
- Data can be to cloud and follows the account to prevent losing
- Support PC end export or printing of data test reports
- Support color matching software to provide more formula inspiration and improve color matching efficiency

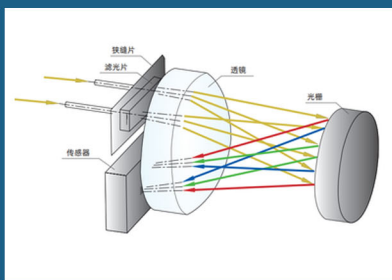
### Double optical path design improves repeatability accuracy

The dual optical path design monitors the energy fluctuation of the light source while measuring the sample signal, reduces interference during measurement, obtains higher measurement stability, and improves the measurement repeatability index of the instrument to  $dE^*ab \leq 0.005$ . The high standard of measurement speed, accuracy, stability and inter-station difference is guaranteed. The relevant technologies are protected by Chinese invention patents and American invention patents.



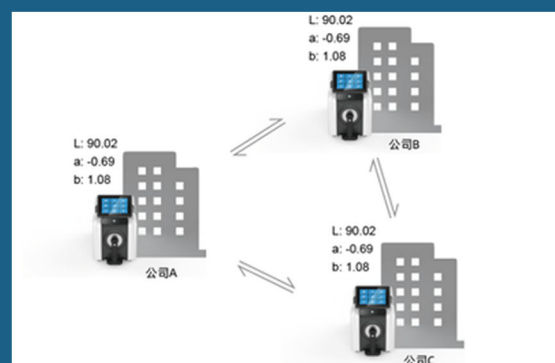
### Differential spectrum engine improves overall measurement performance

The light input of the sensor is increased by 50%, the spectral resolution is increased by 30%, the signal-to-noise ratio is higher, the repeatability, the difference between the instrument, and the data is highly consistent with the data of the standard instrument, the inter-instrument agreement can reach to 0.08, and the repeatability can reach to 0.005. The relevant technologies are protected by Chinese invention patents.



### Excellent inter-instrument agreement

$dE^*ab \leq 0.08$ , High repeatability accuracy:  $dE^*ab \leq 0.005$ , ensure accurate data transfer between factories



### Innovative 1nm resolution grating spectroscopy technology

Innovation is the soul of CHNSpec. After nearly 10 years of dedicated research, the grating combined array sensor made by the innovative MEMS process makes the color measurement more accurate on the basis of 1nm spectral resolution, once again leading the industry innovation direction and greatly improving the technical performance of the product. The relevant technologies are protected by Chinese invention patents.





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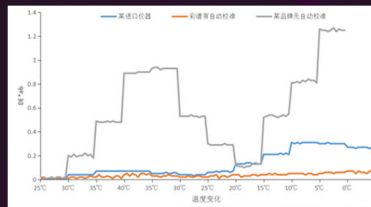
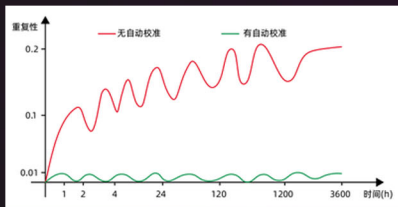
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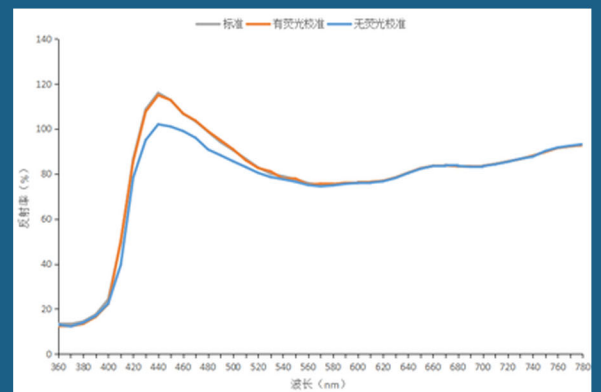
### High precision automatic calibration

Advanced automatic calibration technology greatly improves long-term repeatability of instruments. Under constant temperature, the  $dE^*ab$  of day 1 and day 30 can still reach 0.01. At any temperature change from 0 to 40,  $dE^*ab$  can reach less than 0.1.



### Self-developed fluorescence calibration technique

Automatically adjust the UV intensity, and ensure that the instrument value is highly consistent with the reference value when measuring the fluorescent material.



### Easily measure samples of many shapes with a variety of measuring apertures

Four test calibers, free to switch

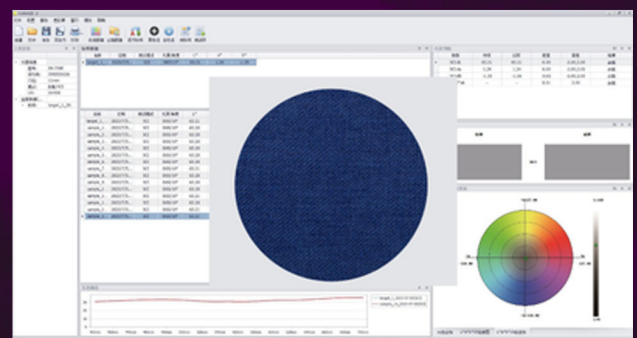
Support measurement in reflection mode: solid, powder, non-transparent liquid

Support measurement in transmission mode: glass, film, transparent liquid



### Configure high-definition preview camera

The clarity of the camera has been significantly upgraded, from the original 400dpi to 1400dpi. When observing the sample, the clarity has been improved by 350% and brightness calibration algorithm has been used to truly restore the color of the ultra dark sample.



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Model	Bench-top spectrophotometer		
	DS-36D	DS-37D	DS-39D
Lighting/measuring conditions	Reflection: d/8 (diffused illumination, 8 degree viewing)		
	SCI (Contains specular component included) / SCE (specular component excluded) Simultaneous measurement. Conform to CIE No.15, GB/T 3978, GB 2893, GB/T 18833, ISO7724/1, DIN5033 Teil7, JIS Z8722 Condition C, ASTM E1164, ASTM-D1003-07		
Sensor	Transmission: d/0 (Diffused illumination, 0 degree viewing)		
	Differential spectrum engine		
	Concave grating		
	152mm		
	360nm-780nm		
	10nm		
	1.6nm		
	0-200%, resolution 0.01%		
	Pulsed xenon lamps and LED		
	Includes UV, 400nm cutoff, 420nm cutoff, 460nm cutoff		
Lighting/measuring calibers	Single mode <2s		
	Reflection: XLAV Ø25.4mm/Ø30mm; LAVØ15mm/Ø18mm; MAVØ8mm/Ø11mm; SAVØ3mm/Ø6mm		
Transmission measurement specification	Users can customize the calibre, and the calibre switch is automatically recognized		
	Transmission: Ø17mm/Ø25mm		
Long-term repeatability	Sample height and thickness: height is not limited, thickness ≤50mm		
	XLAV chroma value: standard deviation ΔE*ab within 0.1 (0°C-40°C arbitrary temperature change) XLAV chroma value: standard deviation ΔE*ab 0.01 or less (under constant temperature conditions, the white correction plate is measured every hour within 24 hours)		
Repeatability *	ΔE*ab≤0.01,	ΔE*ab≤0.005,	
	Spectral reflection/transmittance ≤0.1%	Spectral reflection/transmittance ≤0.1%	
Inter-Instrument Agreement**	XLAV ΔE*ab 0.18	XLAV ΔE*ab 0.12	XLAV ΔE*ab 0.08
Standard observer	2° and 10°		
Viewing light source	A,B,C,D50,D55,D65,D75,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,F11,F12,CWF,U30,U35,DLF,NBF,TL83,TL84,ID50,ID65,LED-B1,LED-B2,LED-B3,LED-B4,LED-B5,LED-BH1,LED-RGB1,LED-V1,LED-V2		
Language	Simplified Chinese, English, Traditional Chinese, Russian, Spanish, Portuguese, Japanese, Thai, Korean, German, French, Polish		
Display	Reflectance and Transmittance graph/value, color value, color difference values, pass/fail, color simulation, color assessment, haze, liquid chromaticity values, color tendency		
Color space	CIE LAB, CIE LUV, LCh, Hunter Lab, Yxy, XYZ, Munsell, s-RGB, βxy		
Chroma index	WI(ASTM E313-20, ASTM E313-73, CIE ISO2470/R457, AATCC Hunter, Taube, Berger Stensby), YI(ASTM D1925, ASTM E313-20, ASTM E313-73), Tint(ASTM E313-20), Metamerism index min, color fastness, staining fastness, ISO brightness, R457, A density, T density, E density, M density, APHA/Hazen/Pt-Co(platinum-cobalt index), Gardner(Gardner Index), Saybolt(Seybert Index), ASTM color, haze, total transmittance, opacity, color strength		
Color difference formula	ΔE*ab, ΔE*CH, ΔE*uv, ΔE*cmc, ΔE*94, ΔE*00, ΔE*ab(Hunter), 555 color shade sort		
Storage	8GB		
Screen size	7-inch touch screen		
Operating system	Android		
Power source	DC regulated power supply		
Operating temperature and humidity	5 ~ 40°C, relative humidity 80%(35°C) below, no condensation		
Storage temperature and humidity	-20 ~ 45°C, relative humidity 80%(35°C) below, no condensation		
Accessories	Power adapter, USB cable, transmission fixture, software U disk, black cavity, white tile, green tile, 30mm aperture, 18mm aperture, 11mm aperture, 6mm aperture, support table, cuvette		
Optional accessories	Heating transmission jig (including control circuit), vertical bracket, pneumatic jacking rod (including control circuit), small sample holding accessories, reflection cupping plate (non-removable), fiber test box, film jig, micro transmission jig, rod box, European standard plug, American standard plug		
Port	RS-232, USB, USB-B, Bluetooth		
Camera positioning	Ultra HD camera (1400dpi)		
Automatic calibration	√ (Can greatly improve the long-term repeatability of the instrument)		
Fluorescence calibration	√ (Can automatically adjust the UV intensity, and ensure that the value of the instrument is highly consistent with that of other imported instruments when measuring materials containing fluorescence)		
Brightness calibration	√ (Through the brightness calibration algorithm, the real color of ultra-dark samples is restored)		
Others	The instrument can be measured sideways, up and down (using accessories); Automatic temperature and humidity compensation function; PC side software save sample image function		