



# MULTI ANGLE SPECTROPHOTOMETER

# MULTI ANGLE SPECTROPHOTOMETER

Multi angle spectrophotometer is instrument with combine color imaging with multi-angle technology to deliver precise color measurements.

## 1200 MULTI ANGLE SPECTROPHOTOMETER

- Multi-angle measurement
- More intuitive display
- Effect measurement discrimination function
- 256 Image Element Double Array CMOS Image Sensor
- Adopt Full spectrum LED light source with blue enhancement
- Concave grating spectrophotometric technology
- Professional-grade white board
- Higher quality
- Ergonomics Novel and fashionable appearance design
- Color camera preview, can clearly observe the measured area
- Multiple color measurement space, multiple observation light sources
- Easily analyze data

## SPECIFICATIONS

Model	BMAS-1201	BMAS-1202	BMAS-1203
Measurement Geometry	3 measurement angles (3 illumination sources, 1 receivers)	5 measurement angles (5 illumination sources, 1 receivers)	6 measurement angles (6 illumination sources, 1 receivers)
Measure Angle	45° Receiver: 45as25°, 45as45°, 45as110° Standards: ASTM D 2244, E 308, E 1164, E 2194, E 2539, DIN 5033, 5036, 6174, 6175-1, 6175-2; ISO 7724, 11664-4 SAE J 1545	45° Receiver: 45as15°, 45as25°, 45as45°, 45as75°, 45as110° Standards: ASTM D 2244, E 308, E 1164, E 2194, E 2539, DIN 5033, 5036, 6174, 6175-1, 6175-2; ISO 7724, 11664-4 SAE J 1545	45° Receiver: 45as-15°, 45as15°, 45as25°, 45as45°, 45as75°, 45as110° Standards: ASTM D 2244, E 308, E 1164, E 2194, E 2539, DIN 5033, 5036, 6174, 6175-1, 6175-2; ISO 7724, 11664-4 SAE J 1545
Light Source	Full spectrum LED light source with blue enhancement		
Lamp Life	5 years, 3 million times measurements		
Spectroscopic Mode	Concave Grating		
Sensor	256 Image Element Double Array CMOS Image Sensor		
Spectral Range	400-700nm		
Wavelength interval	10 nm		
Measurement Range	0~600%		
Semiband Width	10 nm		
Measuring Aperture	Φ12mm		
color space	CIE LAB, XYZ, Yxy, LCh, βxy, DIN Lab99		
Color Difference Formula	ΔE*ab, ΔE*94, ΔE*cmc(2:1), ΔE*cmc(1:1), ΔE*00, DIN ΔE99, ΔE DIN6175		
Other Colorimetric Index	Flop Index		Flop Index, Int-Em
Observer angle	2°/10°		
Illuminant	D65, A, C, D50, D55, D75, F1, F2 (CWF), F3, F4, F5, F6, F7 (DLF), F8, F9, F10 (TPL5), F11 (TL84), F12 (TL83/U30)		
Display	Spectrogram/Values, Samples Chromaticity Values, Color Difference Values/Graph, PASS/FAIL Result, Color Offset		3.5-inch TFT color LCD, Capacitive Touch Screen
Measuring Time	Approx. 1 second for one angle Approx. 3 seconds for all angles	Approx. 1 second for one angle Approx. 5 seconds for all angles	Approx. 1 second for one angle Approx. 6 seconds for all angles
Repeatability	Spectral reflectance: Standard deviation within 0.08% Chromaticity value: ΔE*ab 0.04 ( When a white calibration plate is measured 30 times at 5 second intervals after white calibration)	Spectral reflectance: Standard deviation within 0.08% Chromaticity value: ΔE*ab 0.03 ( When a white calibration plate is measured 30 times at 5 second intervals after white calibration)	Spectral reflectance: Standard deviation within 0.08% Chromaticity value: ΔE*ab 0.03 ( When a white calibration plate is measured 30 times at 5 second intervals after white calibration)
Reproducibility	ΔE* < 0.10, avg on the gray tile of BCRA tile set ΔE* < 0.25, avg on the color BCRA tile set		ΔE* < 0.10, avg on the gray tile of BCRA tile set, ΔE* < 0.25, avg on the color BCRA tile set

Inter-instrument error	0.2ΔE*00(avg on reference Series II BCRA tile set)		
Trigger mode	Pressure sensing trigger, button trigger, software trigger		
Measuring Mode	Single measurement, average measurement (1-99), continuous measurement (1-99)		
Locating Mode	Color camera preview		
Operating Environment	10°C to 50°C, humidity does not exceed 85%, no condensation	-	
Storage Environment	-20°C to 50°C, humidity does not exceed 85%, no condensation	-	
Calibration	Built-in white board parameters, external white board, black light trap, color board		
Calibration Interval	4 hours,8 hours,24 hours,Startup calibration		
3.5-inch TFT color LCD, Capacitive Touch Screen	Interface		-
USB	Data Storage	-	-
1000 pcs Standards,4000 pcs Samples	Language		-
Simplified Chinese, Traditional Chinese, English	Standard Accessories		-
Power Adapter, USB Cable, User Guide,PC Software(download from the official website), Calibration Board, black light trap,Protective cap, wristband	Optional Accessory		-
Micro-printer	Dimension		-
195X83X128mm	Power		-
Weight	About 1Kg		
USB, Bluetooth	-	Data Storage	-
Effect Parameters	-	-	Sparkle Grade(SG),Diffuse coarseness(DC) and Color Variation(CV)
Effect Measurement	-	-	6 angles Sparkle Grade(SG),Color Variation(CV):15as-45°,15as-30°,15as-15°,15as15°,15as45°,15as80° 15d Diffuse coarseness(DC)
Effect Repeatability	-	-	Sparkle Grade(SG) Short-term repeatability: 0.12% (10 times standard deviations) (When a color plate is measured 10 times at 10 second intervals after white calibration) Diffuse coarseness(DC) Short-term repeatability:e0.09% (10 times standard deviations) (When a color plate is measured 10 times at 10 second intervals after white calibration)
Effect Reproducibility	-	-	Sparkle Grade(SG) Reproducibility: 1.9% (10 times standard deviations) (avg on reference Series II BCRA tile set) Diffuse coarseness(DC) Reproducibility: 1.4% (10 times standard deviations)(avg on reference Series II BCRA tile set)
Interface	-	-	USB, Bluetooth
Data Storage	-	-	1000 pcs Standards,4000 pcs Samples
Language	-	-	Simplified Chinese, Traditional Chinese, English
Standard Accessories	-	-	Power Adapter, USB Cable, User Guide,PC Software(download from the official website), Calibration Board, black light trap,Protective cap, wristband
Dimension	-	-	195X83X128mm
Power	-	-	lithium-ion battery, 3.7V,3200mAh, Continuous test 6000 times within 8 hours of full charge

Model	BMAS-1204	BMAS-1205
Measurement Geometry	8 measurement angles (6 illumination sources, 2 receivers)	12 measurement angles (7 illumination sources, 2 receivers)
Measure Angle	45° Receiver: 45as-15°,45as15°,45as25°,45as45°,45as75°,45as110° 15°Receiver: 15as-45°,15as-15° Standards:ASTM D 2244,E 308,E 1164,E 2194, E2539,DIN 5033,5036,6174,6175-1,6175-2;ISO 7724, 11664-4 SAE J 1545	
Light Source	Full spectrum LED light source with blue enhancement	
Lamp Life	5 years, 3 million times measurements	
Spectroscopic Mode	Concave Grating	
Sensor	256 Image Element Double Array CMOS Image Sensor	
Spectral Range	400-700nm	
Wavelength interval	10 nm	

Measurement Range	0~600%	
Semiband Width	10 nm	
Measuring Aperture	Φ12mm	
color space	CIE LAB,XYZ,Yxy,LCh,βxy,DIN Lab99	
Color Difference Formula	$\Delta E^*ab, \Delta E^*94, \Delta E^*cmc(2:1), \Delta E^*cmc(1:1), \Delta E^*00, \text{DIN} \Delta E99, \Delta E \text{DIN}6175$	
Other Colorimetric Index	Flop Index, Int-Em	
Observer angle	2°/10°	
Illuminant	D65,A,C,D50,D55,D75,F1,F2(CWF),F3,F4,F5,F6,F7(DLF),F8,F9,F10(TPL5),F11(TL84),F12(TL83/U30)	
Display	3.5-inch TFT color LCD, Capacitive Touch Screen	
Measuring Time	Approx. 1 second for one angle Approx. 8 seconds for all angles	Approx. 1 second for one angle Approx. 12 seconds for all angles
Repeatability	Spectral reflectance:Standard deviation within 0.08% Chromaticity value: $\Delta E^*ab$ 0.03 ( When a white calibration plate is measured 30 times at 5 second intervals after white calibration)	Spectral reflectance:Standard deviation within 0.08% Chromaticity value: $\Delta E^*ab$ 0.02 ( When a white calibration plate is measured 30 times at 5 second intervals after white calibration)
Reproducibility	$\Delta E^* < 0.10$ , avg on the gray tile of BCRA tile set, $\Delta E^* < 0.25$ , avg on the color BCRA tile set	
Inter-instrument error	0.18 $\Delta E^*00$ (avg on reference Series II BCRA tile set)	
Trigger mode	Pressure sensing trigger, button trigger, software trigger	
Measuring Mode	Single measurement, average measurement (1-99), continuous measurement (1-99)	
Locating Mode	Color camera preview	
Operating Environment	-	-
Storage Environment	-	-
Calibration	Built-in white board parameters, external white board, black light trap, color board	
Calibration Interval	4 hours,8 hours,24 hours,Startup calibration	
3.5-inch TFT color LCD, Capacitive Touch Screen	-	-
USB	-	-
1000 pcs Standards,4000 pcs Samples	-	-
Simplified Chinese, Traditional Chinese, English	-	-
Power Adapter, USB Cable, User Guide,PC Software(download from the official website), Calibration Board, black light trap,Protective cap, wristband	-	-
Micro-printer	-	-
195X83X128mm	-	-
Weight	About 1Kg	
USB, Bluetooth	-	-
Effect Parameters	Sparkle Grade(SG),Diffuse coarseness(DC) and Color Variation(CV)	
Effect Measurement	6 angles Sparkle Grade(SG),Color Variation(CV):15as-45°,15as-30°,15as-15°,15as15°,15as45°,15as80° 15d Diffuse coarseness(DC)	

Effect Repeatability	Sparkle Grade(SG) Short-term repeatability: 0.12% (10 times standard deviations) (When a color plate is measured 10 times at 10 second intervals after white calibration) Diffuse coarseness(DC) Short-term repeatability: 0.09% (10 times standard deviations) (When a color plate is measured 10 times at 10 second intervals after white calibration)
Effect Reproducibility	Sparkle Grade(SG) Reproducibility: 1.9% (10 times standard deviations) (avg on reference Series II BCRA tile set) Diffuse coarseness(DC) Reproducibility: 1.4% (10 times standard deviations)(avg on reference Series II BCRA tile set)
Interface	USB, Bluetooth
Data Storage	1000 pcs Standards, 4000 pcs Samples
Language	Simplified Chinese, Traditional Chinese, English
Standard Accessories	Power Adapter, USB Cable, User Guide, PC Software (download from the official website), Calibration Board, black light trap, Protective cap, wristband
Dimension	195X83X128mm
Power	lithium-ion battery, 3.7V, 3200mAh, Continuous test 6000 times within 8 hours of full charge



**Biolab Scientific Ltd.**

3660 Midland Avenue, Suite 300, Toronto, Ontario M1V 0B8, Canada  
 Email: [contact@biolabscientific.com](mailto:contact@biolabscientific.com) | Website: [www.biolabscientific.com](http://www.biolabscientific.com)