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Portable Spectrophotometers CM-26dG / CM-26d / CM-25d

Portable spectrophotometers with d:8° geometry and horizontal alignment

Introduction

The CM-26dG, CM-26d, and CM-25d are the successors to the CM-2600d and CM-2500d spectrophotometers widely used in the industry. The new devices are portable sphere type spectrophotometers with horizontal alignment, a design most convenient to measure the colour of flat or large samples. All devices deliver measurement data including (SCI) and excluding (SCE) surface conditions in one measurement sequence, at Ultra-High Speed. With their additional 3mm measuring aperture, the devices perfectly adapt to small sample sizes (not for CM-25d), with the CM-26dG being able to also measure the gloss of a surface with a true, ISO compliant 60° gloss sensor.

While the sample observation port allows perfect sample positioning for measurements, the large color display shows measurement data either numerically or graphically. With the additional Configuration Tool Software CM-CT1 and the new image based workflow feature, the devices enable easy configuration across a network and make the actual work for users in the field less erroneous and more convenient.

Features

Unsurpassed accuracy and repeatability

While the CM-25d is the perfect choice for cost-effective applications, the CM-26d and CM-26dG were developed with the aim to reduce the exchange of physical samples throughout the value chain. The CM-26d series allows communication of measurement data based on absolute values to enable true “Digital Colour Data Management”.

By default, all CM-26d and CM-26dG devices are true Close Tolerance (CT) grade instruments, and thus Konica Minolta proofs once more its unsurpassed ability and expertise in optical precision technology. Highest Inter-Instrument-Agreement (IIA) of just ΔE^*_{ab} 0.12 (Average on 12 BCRA tiles) defines a new level of performance.

Modern and intuitive

With its lightweight ergonomic design, optional Bluetooth™ and high-resolution TFT colour display, the CM-26d series is perfectly suited for applications in the field. Being able to filter stored data based on additional information (tagging) as well as image-based workflows for easy and simple usage by uneducated users, it sets a new standard for easy and fast data handling.

With the additional Configuration Tool Software CM-CT1, administrators can setup and share settings all across their company network, even globally. With the Remote Support feature, support and training of user becomes as easy as never before.

Ultra-Fast

The CM-26d series measures in Ultra-High-Speed. While single condition (SCI or SCE) measurements take less than a second, any combined measurements (SCI/SCE or SCI/Gloss (CM-26dG only)) are made in less than two seconds.

Two measuring apertures to cover all sample sizes

The CM-26d series offers great flexibility of use with two easily interchangeable measurement apertures with Ø 8 mm (MAV) and Ø 3 mm (SAV). The two lens position settings guarantee perfect data correlation with both apertures, enabling measurement of all sample sizes and shapes.

Functions and features CM-26d/CM-26dG

- d°:8° geometry with Xenon Flash technology and optical sample preview
- Two measurement areas: MAV (8mm) and SAV (3mm) (CM-25d: only MAV)
- Best-in-class Inter-Instrument-Agreement for true “Digital Colour Data Management”
- Connectable via USB and optional Bluetooth™
- Large and easy-to-read high-resolution 2.7” TFT colour display
- Group sorting of data by user-definable tags
- Image-based workflows
- Only CM-26dG: additional integrated 60°-gloss sensor

Specifications

Principal Specifications CM-26dG/CM-26d/CM-25d

Model		CM-26dG	CM-26d	CM-25d
Color	Illumination/ viewing system	di:8°, de:8° (complies to DIN5033-7, JIS Z 8722c, ISO7724/1, CIE No.15)		
	Integrating sphere	Ø54mm		
	Detector	Dual 40-element silicon photodiode array	Dual 40-element silicon photodiode array	Dual 32-element silicon photodiode array
	Spectral separation device	planar diffraction grating		
	Wavelength range	360-740 nm	360-740 nm	400-700nm
	Wavelength pitch	10 nm		
	Half bandwidth	approx. 10 nm		
	Measurement range	0~175%		
		Resolution: 0.01%		
	Light source	Pulsed Xenon lamp		
	Light source life time	more than 1 Million		
	Illumination area	12.0×12.5 mm	MAV: Ø12.0mm	MAV: Ø12.0mm
			SAV: Ø6.0mm	
	Measurement area	MAV: Ø8.0 mm	MAV: Ø8.0 mm	MAV：Ø8.0 mm
		SAV: Ø3.0 mm	SAV: Ø3.0 mm	
	Measurement time	approx.1sec (SCI or SCE + gloss measurement)	approx. 0.7sec (SCI or SCE)	approx. 0.7sec (SCI or SCE)
	Min. measurement interval	approx.2sec (SCI or SCE + gloss measurement)	approx. 1.5sec (SCI or SCE)	approx. 1.5sec (SCI or SCE)
	Repeatability	Standard deviation within ΔE^*_{ab} 0.02	Standard deviation within ΔE^*_{ab} 0.02	Standard deviation within ΔE^*_{ab} 0.04

Model		CM-26dG	CM-26d	CM-25d
	IIA	within ΔE^*_{ab} 0.12 (MAV/SCI) Average for 12 BCRA Series II color tiles compared to values measured with master body.	within ΔE^*_{ab} 0.12 (MAV/SCI) Average for 12 BCRA Series II color tiles compared to values measured with master body.	within ΔE^*_{ab} 0.20 (MAV/SCI) Average for 12 BCRA Series II color tiles compared to values measured with master body.
	UV control	UV100 / UV0	UV100 / UV0	UV0
	Observer	2°, 10°		
	Illuminants	A, C, D50, D65, F2, F6, F7, F8, F10, F11, F12, ID50, ID65, User Illuminant		
	Displayed data	Spectral values/graph, Colorimetric values/graph, Color-difference values, Pass/Fail Judgement, Pseudocolor, Graphical Workflows (Job)		
	Colorimetric data	L*a*b*, L*C*h°, HunterLab, Yxy, XYZ, and Color Differences in these color spaces, Munsell		
	Indexes	MI, WI (ASTM E313), YI (ASTM E313, ASTM (1925), ISO Brightness (ISO2470), WI/Tint (CIE), DIN99o, Strength, Opacity, Greyscale		
	Color difference formulas	ΔE^*_{ab} (CIE1976), ΔE_{94} (CIE1994), ΔE_{00} (CIE2000), ΔE_{CMC} (l:c), HunterΔE, ΔE_{99o} (DIN6172)		
Gloss	Measurement geometry	60° (complies to ISO 2813, ISO 7668, ASTM D523-08, ASTM D2457-13, DIN 67530, JIS-Z8741, JIS-K5600)	N/A	
	Light source	White LED	N/A	
	Detector	Silicon photo diode	N/A	
	Measurement range	0-200 GU	N/A	
		Resolution: 0.01 GU		
	Measurement area	MAV: Ø10.0 mm	N/A	
		SAV: Ø3.0 mm		
	Repeatability	0-10 GU: 0.1 GU	N/A	
		10-100 GU: 0.2 GU		
		>100 GU: 0.2% (Standard deviation)		
	IIA	0-10 GU: ±0.2 GU	N/A	

Model		CM-26dG	CM-26d	CM-25d
		10-100 GU: ±0.5 GU (MAV)		
	Data memory	Targets: 1.000		
		Sample: 5.000		
	Battery performance	approx. 3.000 measurement/charge		
		approx.1.000 measurement/charge when using Bluetooth™ communication		
	Display	2.7 inch TFT color LCD		
	Languages	English, German, French, Italian, Spanish, Portuguese, Russian, Turkish, Polish, Chinese (Simplified), Japanese		
	Interfacing	USB2.0, Bluetooth™ (optional)		
	Power	Rechargeable Lithium-ion battery, USB bus power		
	Charging time	approx. 6 hours at complete discharge		
	Operation temperature/	5-40°C / rH 80% or less (at 35°C) with no condensation		
	humidity range			
	Storage temperature/	0-45°C / rH 80% or less (at 35°C) with no condensation		
	humidity range			
	Size [mm]	81.2×93.3×228.6		
	Weight [g]	Approx. 660 g	Approx. 630 g	Approx. 620 g

Specifications are subject to change without prior notice.

Portable Spectrophotometer CM-23d

Portable spectrophotometer with sphere geometry and horizontal alignment

Introduction

The CM-23d is a portable sphere type spectrophotometers with horizontal alignment, which is most convenient to measure the colour of flat or large samples. The CM-23d delivers measurement data including (SCI) and excluding (SCE) surface conditions in one measurement sequence.

Fit for left- or right hand users, easy and simple operation is achieved with the common interface known from other Konica Minolta portable devices and the sample observation port allows perfect sample positioning. The large information display shows measurement data either as numerically or graphically.

Features

Simple yet sophisticated

The CM-23d combines very simple, comfortable and intuitive use with the highly sophisticated, innovative and patented Optical System to meet the high expectations for colour measurement in Quality Assurance. Together with the high energy xenon flash illumination and the high resolution monolithic dual beam monochromator, the entire optical guarantees substantial advantages in speed and reliability.

The sleek body and a large color display ensure perfect handling in any position, while keeping setting operations simple and convenient.

Specifications

Model	CM-23d

Illumination / Viewing system	d:8° (diffuse illumination, 8-degree viewing), equipped with simultaneous measurement of SCI (di:8° specular component included) / SCE (de:8° specular component excluded) Conforms to (complies to DIN5033-7, JIS Z 8722c, ISO7724/1, CIE No.15)
Sphere Size	Ø 54 mm
Light-receiving element	Silicon photodiode array (dual 32 elements)
Spectral separation device	Planar Diffraction Grating
Wavelength range	400 nm to 700 nm
Wavelength pitch	10 nm
Half bandwidth	Approx. 10 nm
Reflectance range	0 to 175%, resolution: 0.01%
Light source	Pulsed Xenon lamp (with UV cut)
Measurement time	~ 0.7 seconds (SCI or SCE)
Minimum measurement interval	~ 1.5 seconds (SCI or SCE)
Measurement/illumination area	MAV : Ø 8 mm / Ø 12 mm
Repeatability	Standard deviation within ΔE*ab 0.08 (Measurement conditions: white calibration plate measured 30 times at 5-second intervals after white calibration)
Inter instrument agreement	WithinΔE*ab 0.4 (MAV/SCI) Average for 12BCRA Series II color tiles compared to values measured with master body at 23°C.
Interface	USB 2.0 (Bluetooth™ optional)
Observer condition	CIE: 2° and 10° colorimetric standard observer
Illuminant condition	CIE: A, C, D50, D65, F2, F6, F7, F8, F10, F11, F12, ID50, ID65 (simultaneous evaluation is possible using two light sources)
Display data	Colorimetric values/graph, color difference values/graph, spectral graph, pass/fail judgment, pseudocolor
Color space / colorimetric data	L*a*b*, L*C*h, CMC(1:1), CMC(2:1), CIE94, CIE00, Yxy, XYZ (and color difference in these spaces); Munsell (C), MI, WI (ASTM E313-73), YI (ASTM D1925), Opacity,
Data memory	1000 targets + 1700 samples
Power source	Dedicated lithium-ion battery (removable), USB bus power (with lithium-ion battery installed), Dedicated AC adapter (with lithium-ion battery installed)
Dimensions (W × H × D) [mm]	81 × 93 × 229
Weight [g]	~620

Operating temperature / humidity range (*1)	5 – 40°C, relative humidity 80% or less (at 35°C) with no condensation
Storage temperature/humidity range	0 – 45°C, relative humidity 80% or (at 35°C) with no condensation
Standard accessories	White and Zero calibration box, Target mask Ø 8 mm, USB cable, USB-AC-Adapter, Li-Ion Battery pack, Wrist-strap
Optional accessories	Hard case, Bluetooth™ module, SpectraMagic™NX (software), positioning tool
Display languages	English, German, French, Italian, Spanish, Portuguese, Russian, Turkish, Polish, Chinese (Simplified), Japanese

Specifications are subject to change without prior notice.

Portable Spectrophotometsers CM-25cG

Portable spectrophotometer with 45°c:0° geometry and true 60°-gloss-sensor

Introduction

The new CM-25cG is the successor to the CM-2500c which is the standard model for interior trims in the automotive industry. The CM-25cG is an even more compact and lightweight portable spectrophotometer with 45°c:0° geometry and a true high performance 60°-gloss-sensor. The 45°:0° geometry used is renowned for providing colour values offering excellent correlation to visual perception. This is achieved by fully excluding surface effects of gloss and/or texture. The built-in gloss-sensor accurately measures surface gloss.

With no compromises in performance, the CM-25cG has been designed to match or exceed standards for colour and gloss measurement in a number of industries, including automotive interior materials and high visibility textiles (EN471) or coatings).

Being fully compatible to the previous CM-2500c model, the CM-25cG's perfect circular optical system (defined as 45°c:0°) achieves high accuracy and repeatability, especially on textured or structured surfaces, regardless of measurement direction. Not only does it measure colour, but also true 60°-gloss at the same time and, as a world premiere, not only for standard MAV aperture size (8mm) but also for small measurement areas with 3mm spot size.

The CM-25cG is lightweight and uses a large and easy-to-read colour display to show and manage measurement data either numerically or graphically. For correct positioning on a sample, the CM-25cG is the first device offering a true optical sample viewer in a 45°:0° geometry instrument.

Features

Innovative optical system combining colour and gloss measurements for unsurpassed accuracy and repeatability

With it's innovative combination of 45°:0° geometry and true gloss sensor for even the smallest parts the CM-25cG enhances the flexibility and accuracy to match visual perception. It consists of a mixing box (integrating sphere) with an innovative poly-mirror system to create a near-ring shaped illumination on the sample with an embedded 60° gloss-sensor which conforms to ISO standards.

Compared to the typical 45°:0° geometry used in other spectrophotometers, the benefits of the optical system used in the CM-25cG results in significantly improved repeatability as well as inter-instrument and superb inter-model-agreement to the CM-2500c series. The innovative optical system eliminates directional dependency and minimizes

the influence of changes in measuring position, instrument rotation, sample positioning and sample inclination. This offers important advantages on frosted, textured and structured material surfaces such as plastic parts used in automotive interior trims.

With its lightweight ergonomic design, optional Bluetooth® and high-resolution colour display, the CM-25cG is perfectly suited for applications in the production environment. It sets a new standard for an instrument that is easy and fast to handle and able to filter stored data based on group sorting by additional information (tagging) and measure data in less than 1 second.

CM-25cG: State of the Art on all Agreement levels

The CM-25cG was developed in close cooperation with major car markers with the aim, to reduce the exchange of physical samples with suppliers while at the same time keeping historical data, to allow the user to communicate measurement data based on absolute values enabling true “Digital Colour Data Management” throughout the value chain.

By default, all CM-25cG are true Close Tolerance (CT) grade instruments, and thus Konica Minolta proves once more it’s unsurpassed ability and know-how in optical precision technology. Highest Inter-Instrument-Agreement (IIA) levels of just ΔE^*_{ab} 0.15 (Average on 12 BCRA tiles) series as well for Inter-Model-Agreement (IMA) to the CM-2500c series define a new level of performance.

Functions and features

- Unique 45°c:0° geometry with gloss measurement and optical sample preview
- Two measurement areas: MAV (8mm) and SAV (3mm) for colour and gloss in one instrument
- Xenon Flash illumination for best accuracy on dark colours
- Measurement speed <1s
- 360-740 nm wavelength range, 10 nm resolution
- Lightweight (~600g with battery), compact and rugged for on-site measurements
- Connectable via USB and optional Bluetooth®
- Large and easy-to-read high-resolution 2.7” colour display
- Group sorting of data by user-definable tags

Specifications

Model	CM-25cG	
	Colour	**Gloss**
Illumination/viewing system	45°c:0° method (45° circumferential illumination, 0° vertical viewing) CIE No.15, ISO 7724/1, ASTM E179, DIN 5033-7, JIS Z 8722 compliant	60° ISO 2813, ISO 7668, ASTM D523, ASTM D2457, DIN 67530, JIS Z8741, JIS K5600 compliant optical system
Detector	Dual 40-element silicon photodiode arrays	Silicon photo diode
Spectral separation device	Planar diffraction grating	
Wavelength range	360 nm to 740 nm	
Wavelength pitch	10 nm (approx. 10 nm FWHM)	
Reflectance range	0 to 175%, resolution: 0.01%	0-200 GU; Output/display resolution：0.01 GU
Light source	Pulsed Xenon Lamp	White LED
Measurement time	Approx. 1.0 second	
Minimum interval between measurements	Approx. 2.0 seconds	
Battery performance	Standalone: Approx. 3000 measurements (at 10s intervals at 23°C) Bluetooth®: Approx. 1000 measurements (at 10s intervals at 23°C)	
Measurement/illumination area	MAV: Ø8.0 mm / 12 x 16 mm SAV: Ø3.0 mm / 12 x 16 mm	MAV: Ø10 mm SAV: Ø3.0 mm
Repeatability	Standard deviation within ΔE*ab 0.04 (Measurement conditions: White calibration plate measured 30 times at 10-second intervals after white calibration was performed)	0 - 10 GU: ±0.1GU 10 - 100 GU: ±0.2GU >100 GU: ±0.2%
Inter-Instrument Agreement	Within ΔE*ab 0.15 (Average for 12 BCRA Series II color tiles compared to values measured with master body at	Gloss value (MAV): 0 - 10 GU: ±0.2GU

Model	CM-25cG	
	23°C)	10 - 100 GU: ±0.5GU (MAV. Compared to values measured with a master body under Konica Minolta standard conditions)
Interface	USB 2.0 Standard, Bluetooth® Optional	
CIE Observer	2° and 10° CIE standard colorimetric observer	
CIE Illuminants	A, C, D50, D65, F2, F6, F7, F8, F10, F11, F12, ID50, ID65, User illuminant (simultaneous evaluation with two light sources possible)	
Display data	Spectral values/graph, colorimetric values/graph, colour difference values/graph, PASS/FAIL judgment, pseudo colour, colour assessment	
Color space / Colorimetric data	XYZ, Yxy, CIELAB, CIELCh, HunterLAB, ΔE^*_{ab}, ΔE94, ΔE00, CMC (l:c), ΔE_{Hunter}, MI, Munsell, WI (ASTM E313-73/96; CIE(WI/Tint)), YI (ASTM E313-73/96; ASTM D1925), ISO Brightness	
Data memory	Targets: 2500 Samples: 7500	
Power source	Rechargeable Lithium-Ion battery, USB bus power	
Dimensions (W × H × L) [mm]	81 x 81 x 224	
Weight [g]	Approx. 600 (with battery)	
Display languages	English, French, German, Italian, Polish, Portuguese, Russian, Spanish, Turkish, Chinese (simplified), Japanese	
Display	2.7-inch TFT color LCD	
Operating temperature / humidity range	5 - 40°C, relative humidity 80% or less (at 35°C) with no condensation	
Storage temperature / humidity range	0 - 45°C, relative humidity 80% or less (at 35°C) with no condensation	

Model	CM-25cG
Standard accessories	Calibration stage, Lithium-Ion battery, flat-type battery cover, wrist strap, USB cable, USB power supply
Optional Accessories	Hard case, Battery charger and spare batteries, stapler-type target mask, Bluetooth® module, SpectraMagic™ DX software

Specifications are subject to change without prior notice.

Optional accessories for CM-25cG

Hard case

For storing and carrying the instrument and its accessories.

Battery charger

CM-A237 BATTERY CHARGER (240V)

Item Order Code: A9AG-705

Spare battery

CM-A235 LITHIUM-ION BATTERY GEN 2

Item Order Code: A9AG-713

Staple-type target mask

CM-A216 STAPLER TYPE TARGET MASK

Item Order Code: A9AG-700

Bluetooth® module

CM-A219 BLUETOOTH MODULE

Item Order Code: A9AG-710

SpectraMagic™ DX software

SPECTRAMAGIC™ NX Software

Portable Spectrophotometers CM-700d (No Wireless)/ CM-600d (No Wireless)

Ideal for colour measurement of solid samples. The vertical alignment of this portable spectrophotometer means that it has a small footprint, perfect for small or curved surfaces.

Introduction

The new devices are portable sphere type spectrophotometers with vertical alignment, perfectly suited for precise and repeated colour measurement of shaped and curved samples. For each measurement, data for specular components included (SCI) and excluded (SCE) are taken simultaneously to analyse the surface conditions.

A large size colour LCD screen for numerical and graphic data display brings colour measurement to levels never experienced before. In addition, the CM-700d (No Wireless) offers additional 3mm measuring aperture to perfectly adapt to small sample sizes. Easy and intuitive user guidance in 6 languages guarantees maximum efficiency for daily colour quality control in the lab or the production line.

The new generation of portable spectrophotometers offer new technologies, enhanced ergonomics by applying Konica Minolta’s advanced optical design and signal processing technology

Features

Measure anything anywhere!

With the new devices you can measure any sample of any kind! The ergonomic vertical alignment is perfectly suited to position and measure round or even concave shaped parts and samples with single hand operation. Weighing just 550 g, the new devices are the most very lightweight and thus allow excellent portability for on-site measurement. On the CM-700d (No Wireless), the measuring aperture is selectable between Ø 8 mm and Ø 3 mm to measure even small sample sizes.

The new devices are equipped with a large LCD screen to improve colour data reading & perception by displaying colour readings both in numerical or graphical mode to improve operability and understanding. Pseudo colour simulations to express colour difference or metamerism are also possible for rapid visual indication.

Easy to operate!

The new devices also set new standards in ease of use and intuitive operation. Five dedicated buttons for the most important operations and displayed menu guidance in 6 languages make it easy to navigate through all functions and features. Data memory capacity allows users to store up to 1,000 targets and 4,000 measurement sets. With the “Auto target” function, the instrument searches for the closest target of any measured colour.

More than you expect!

In addition to all the advanced technology, both models come with a full list of features and functions you can expect from the leader and pioneer in portable colour measurement:

1. **Sphere geometry with simultaneous measurement (automatic switching) of specular components included (di:8°) and excluded (de:8°)**
2. **Powerful and long-life Xenon Flash illumination for maximum accuracy even on dark and saturated colours**
3. **Highest levels in Inter-Instrument- and Inter-Model-Agreement, essential for global colour data exchange**
4. **Choice of 3 power supply modes: Dry battery, rechargeable batteries (4 AA size) or AC Adapter for maximum flexibility**
5. **Automatic “Stand-by” power saving function mode**

Specifications

Principal Specifications CM-700d (No Wireless)/ CM-600d (No Wireless)

Model	CM-700d (No Wireless)	CM-600d (No Wireless)
Illumination/viewing system	di:8°, de:8° (diffused illumination, 8-degree viewing angle), d:8° (diffuse illumination/8° viewing angle), selectable SCI (di:8° specular component included) and/or SCE (de:8° specular component excluded) measurement. Conforms to CIE No. 15, ISO 7724/1, ASTM E-1164, DIN 5033 Teil 7, and JIS Z8722 Condition C standards.	
Size of integrating sphere	Ø 40 mm	
Detector	Silicon photodiode array (dual 36-element)	
Spectral separation device	Diffraction grating	
Wavelength range	400 nm to 700 nm	
Wavelength pitch	10 nm	
Half bandwidth	Approx. 10 nm	
Light source	Pulsed xenon lamp (with UV cut filter)	
Measurement time	Approx. 1 second	
Battery performance	With alkaline dry batteries: Approx. 2,000 measurements With nickel-metal-hydride rechargeable batteries (2,300 mAh): Approx. 2000 measurements with full charge * Measured at 10-second intervals at 23°C; measurement fixed at SCI or SCE	
Measurement/illumination area	MAV: Ø 8 mm / Ø 11 mm SAV: Ø 3 mm / Ø 6 mm *Changeable by replacing target mask and selecting lens position	MAV: Ø 8 mm / Ø11 mm only
Repeatability	Spectral reflectance: Standard deviation within 0.1%, Chromaticity value: Standard deviation within ΔE *ab 0.04 *When a white calibration plate is measured 30 times at 10-second intervals after white calibration	
Inter-instrument agreement	Within ΔE*ab 0.2 (MAV/SCI) * Based on 12 BCRA Series II color tiles compared to values measured with a master body at 23°C	
Display	2.36-inch TFT color LCD	
Interface	USB1.1	
Observer condition	CIE: 2° and 10° standard observer	

Illuminant condition	CIE: A, C, D50, D65, F2, F6, F7, F8, F10, F11, F12 (simultaneous evaluation is possible using two light sources)
Displayed data	Spectral values/graph, colorimetric values, colour difference values/graph, PASS/FAIL result, colour patch, colour assessment
Color spaces	L*a*b*, L*C*h, Hunter Lab, Yxy, XYZ, Munsell, and colour difference in these spaces (except for Munsell)
Colorimetric data	MI, WI (ASTM E313), YI (ASTM E313-73/ASTM D1925), ISO Brightness, 8° gloss value
Color difference formulas	ΔE*ab (CIE1976), ΔE*94 (CIE1994), ΔE00 (CIE 2000), CMC (l:c)
Storable data sets	Measurement data: 4000 sets/Target colour difference data: 1000 sets
Power	4 AA-size alkaline dry batteries or nickel-metal-hydride rechargeable batteries; , Special AC adapter
Dimensions (W x H x D)	73 x 211.5 x 107 mm
Weight	Approx. 550 g (without white calibration cap and batteries)
Operating temperature/ humidity range	5 to 35°C; relative humidity 80% or less with no condensation
Storage temperature/ humidity range	0 to 45°C; relative humidity 80% or less with no condensation

Optional accessories for CM-700d (No Wireless)/ CM-600d (No Wireless)

Universal Target Mask for CM-700d (No Wireless) Series CM-A523

- Small footprint and enhanced standing stability
- Target finder without offset
- Integrated ring groove for Retaining Ring and Cell Holder to measure powder or liquids with tube cells
- Interior tube cell holder for powdery and pasty materials using aperture with glass plate
- Triangular groove to reproducibly position long objects with a radius
- Alternative positioning fixture

Item Order Code: B027256

Zero Calibration Box CM-A182

For perfect zero calibration. The black cavity tube prevents ambient light from entering the sensor during the calibration.

Item Order Code: A0E8-705

Glass protected Target Masks Ø 8 mm CM-A183

Target mask with glass protection plate to measure soft or wet samples. The protection glass plate prevents specimen from entering the instrument. The CM-A183 is also recommended for flattening soft specimen. The diameter of the measuring area is 8 mm and the size of disk is 40 mm in diameter.

Item Order Code: A0E8-706

Dust Cover Set CM-A185

Plastic cover and glass protected 8mm target mask to measure dusty materials with prevention of contaminating the instrument.

Item Order Code: A0E8-708

Replacement Dust Cover CM-A186

Item Order Code: A0E8-709

CM-A96 Transmittance Specimen Holder (for use with CM-A514)

Required to fix opaque samples or the Glass or Disposal cells for measurement of opaque liquids in combination with the Sample Holder CM-A514. The clamp provides a constant pressure to the sample and the moveable side holders keep the cells in correct position.

Item Order Code: 1864-708

Sample Holder CM-A514

With the Sample Holder CM-A514 the instrument is set in horizontal position. Allows in combination with the Specimen Holder CM-A96 measurements of small samples up to a thickness of 22.5 mm or with the Glass- or Disposal Cells with 10 or 20 mm optical path the measurement of opaque liquids.

Item Order Code: B027152

Cell Holder CM-A515

For measurements of powders, paste and grains in combination with the Glass Cell CR-A504. The measuring head is set to up-side down position and the Cell Holder CM-A515 precisely fixes the position of the Glass Cell CR-504. To secure the instrument in a save position against tipping the Vertical Stand USD CM-A516 is recommended.

Item Order Code: B027153

Glass Cell CR-A504

Round cell made of optical glass (Diameter 34 mm) for measurements of powders, pastes, grains and small granular materials. For precise positioning, Cell Holder CM-A515 is recommended.

Item Order Code: 9970-2504

Vertical Stand USD CM-A516

Stand to align the instrument in up-side-down position. Ideal to be combined with Cell holder CM-A515.

Item Order Code: B027154

CM-A98 Rectangular Cell 50 x 38, optical path 10 mm

Rectangular cell made of optical glass for precise transmittance measurement of transparent liquids. The optical path is 10 mm and recommended for liquids with normal optical density.

Item Order Code: 1864-710

CM-A99 Rectangular Cell 50 x 38, optical path 20 mm

Rectangular cell made of optical glass for high precision transmittance measurement of transparent liquids. The optical path is 20 mm and recommended for liquids with low optical density.

Item Order Code: 1864-711

Flow-Cell with 10 mm path CM-A508

Flow cell with 10 mm path for reflectance measurements of water based opaque liquids in combination with Sample Holder CM-A514 and Specimen Holder CM-A96.

Item Order Code: 9970-237

CM-A131 Rectangular Disposal Cell 50 x 38, optical path 10 mm

Rectangular disposal cell made of PMMA with an optical path of 10 mm. Suitable for transmittance measurements of water based transparent liquids. Recommended for liquids with normal density.

Item Order Code: 1870-716

CM-A132 Rectangular Disposal Cell 50 x 38, optical path 20 mm

Rectangular disposal cell made of PMMA with an optical path of 20 mm. Suitable for transmittance measurements of water based transparent liquids. Recommended for liquids with low density.

Item Order Code: 1870-717

Hard Case CM-A176

For storing and hand carry the instrument and accessories.

Item Order Code: A0E8-604

Black Glass Tile CM-A511

Black glass tile with high gloss and absorption. Due to extreme long-term stability recommended as background standard.

Item Order Code: 9970-1109

Portable Multi-Angle Spectrophotometer CM-M6

Portable multi-angle spectrophotometer with 6 angles and double-path system

Introduction

The CM-M6 is a portable multi-angle spectrophotometer especially designed for colour measurement of metallic and effect paints and plastics. It uses a new, patented double-path illumination system with directed 45° illumination and 6-angle observation (-15°/15°/25°/45°/75°/110° aspecular) from two sides to accurately measure painted parts at the automotive production floor.

This new, patented optical measurement system is optimized to give accurate and stable results even on curved surfaces. Therefore, samples such as front and rear bumpers, vehicle mirror bodies or door handles can be measured fast, accurately and repeatedly.

Specifications

Model	CM-M6
Illumination/viewing system	45° illumination: -15° / 15° / 25° / 45° / 75° / 110° aspecular viewing angles with double-path technology
Detector	Dual 40-element silicon photodiode arrays
Spectral separation device	Linear variable filter
Wavelength range	400 to 700 nm
Wavelength pitch	10 nm
Photometric range	0 to 600 %; Output/display resolution: 0.01%
Light source	High-CRI white LED

Model	CM-M6
Measurement time	Approx. 4.5 s; Minimum measurement interval: Approx. 5 s
Battery performance	Approx. 1500 measurement at 10-sec. intervals from fully charged battery
Measurement/illumination area	Ø 6 mm / Ø 12 mm
Repeatability	Colorimetric value: Standard deviation within ΔE*ab 0.05 (when a white calibration plate is measured 30 times at 10-second intervals after white calibration)
Inter-Instrument Agreement	Within ΔE*ab 0.2 (Averaged for 12 BCRA Series II tiles compared to values measured with a master body at 23°C)
Interface	USB2.0; Bluetooth®: optional
Display	3.5-inch TFT Color LCD
Display data	Colorimetric data: L*a*b*, L*C*h Color difference data: Δ(L*a*b*), Δ(L*C*H*), ΔE*ab, CMC(l:c), ΔE94 (CIE1994), ΔE_{00}(CIE DE2000), DIN6175-2 Other data display: MI, FF value, line graph, pass/fail judgement
Observer condition	2° and 10° colorimetric standard observer
Illuminant condition	A, C, D50, D65, F2, F6, F7, F8, F10, F11, F12 (simultaneous evaluation with two light sources possible)
Display languages	English, German, French, Italian, Spanish, Portuguese, Russian, Turkish, Polish, Chinese (simplified), Japanese
Operating temperature/humidity range	0 - 40°C; relative humidity 85% or less (at 35°C) with no condensation
Storage temperature/humidity range	-20 - 45°C; relative humidity 85% or less (at 35°C) with no condensation
Power	Removable Lithium-ion rechargeable battery or AC Adapter
Dimensions (W × H × D)	Approx. 152 × 239 × 81 mm
Weight	Approx. 1.1 kg (including battery)
Standard accessories	White calibration plate, USB cable, AC adapter, Lithium-Ion battery pack, Zero Calibration Box
Optional Accessories	Charging stand for spare batteries; spare battery packs, Bluetooth® module SpectraMagic™DX (software)

Specifications are subject to change without prior notice.

Features

The CM-M6 measures the colour of a sample by illuminating the sample from two directions by high power rendering white LEDs. One time the sample is illuminated from 45° from the left side of the normal and one time from 45° from right side of the normal, while observation for both conditions is made from 6 angles as described in ASTM E2194 or DIN 5033-7 (-15°/15°/25°/45°/75°/110° aspecular).

By merging measurements from both directions, the instrument is very stable to inclination and tilting, making it ideal for QC measurements at the production floor for curved objects with metallic effect coatings as used in automotive exterior.

Its compact and lightweight vertical shape is easy to hold by one or two hands and enables easy positioning, while the high-resolution back-illuminated colour display is easy to read even in the lowest ambient lighting conditions.

Main Features

- Double-path illumination/observation system for stable measurements on curved surfaces
- Compact and lightweight vertical design allows fast and accurate QC in the production line
- Large high-resolution, back-illuminated colour display
- Optional Bluetooth®

Optional accessories for CM-M6

Hard case

For storing and carrying the instrument and its accessories.

Item Order Code:

Battery charger

For external charging of spare battery packs.

Item Order Code:

Spare battery

To enable power backup for standalone usage.

Item Order Code:

Bluetooth® module

External module to enable Bluetooth® communication

Item Order Code:

SpectraMagic™ DX software

Data eXchange Software to easily visualize and manage digital data

Item Order Code:

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