Main specifications

Model	Spectrophotometer CM-5	
Measuring geometry	Reflectance:	di:8°, de:8° (diffuse illumination: 8° viewing)
		SCI (specular component included)/SCE (specular component excluded) switchable
		Conforms to CIE No. 15, ISO 7724/1, ASTM E 1164, DIN 5033 Teil 7, and JIS Z 8722 condition c standard.
	Transmittance:	di:0°, de:0° (diffuse illumination: 0° viewing)
		Conforms to CIE No. 15, ASTM E 1164, DIN 5033 Teil 7, and JIS Z 8722 condition g standard.
Integrating sphere size	Ø152 mm	
Detector	Dual 40-element silicon photodiode arrays	
Spectral separation device	Planar diffraction grating	
Wavelength range	360 nm to 740 nm	
Wavelength pitch	10 nm	
Half bandwidth	Approx. 10 nm	
Measurement range	0 to 175 % (Reflectance or transmittance); Output/display resolution: 0.01%	
Light source	Pulsed xenon lamp	
Measurement time	Approx. 1 s (to data display/output); Minimum measurement interval: Approx. 3 s	
Illumination/ measurement area	Reflectance:	Changeable by changing mask and settings. LAV: Ø36 mm/Ø30 mm; MAV (optional): Ø11 mm/Ø8 mm; SAV (optional): Ø6 mm/Ø3 mm
	Transmittance:	Ø26 mm/Approx. Ø20 mm
Repeatability	Spectral reflectance: Standard deviation within 0.1% (400 nm to 740 nm) 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 0.15 (Typical) (LAV/SCI) (Based on 12 BCRA Series II color tiles compared to values measured with a master body under Konica Minolta standard conditions)	
Transmittance chamber	No sides (unlimited sample length); Depth (maximum sample thickness): 60 mm Sample holders (optional) for holding sheet samples or containers of liquid samples can be installed/removed	
Display	5.7-inch TFT color LCD	
Display languages	English, Japanese, German, French, Italian, Spanish, Simplified Chinese, Portuguese	
White/100% calibration	Automatic white (reflectance)/100% (transmittance) calibration using internal white calibration plate (Not applicable to 100% calibration when using cells for transmittance measurements of liquids.)	
Interfaces	USB 1.1 (Connection to PC; USB memory stick); RS-232C standard (Connection to serial printer)	
Observer	2° Standard Observer or 10° Standard Observer	
Illuminant	A, C, D50, D65, F2, F6, F7, F8, F10, F11, F12, ID50, ID65 (simultaneous evaluation with two light sources possible)	
Displayed data	Spectral values/graph (reflectance, transmittance, absorbance) , colorimetric values/graph, color-difference values/graph, pass/fail judgment, pseudo color, color assessment	
Color space	L*a*b*, L*C*h, Hunter Lab, Yxy, XYZ, and color differences in these spaces; Munsell	
Index	Reflectance:	MI; WI (ASTM E 313-73, ASTM E 313-96); YI (ASTM E 313-73, ASTM E 313-96, ASTM D 1925); ISO Brightness; B (ASTM E 313-73)
	Transmittance:	Gardner; Iodine Color Number; Hazen/APHA; European Pharmacopoeia; US Pharmacopeia
User index	User-defined index (Optional Data Management Software SpectraMagic™ NX required for setting user index.)	
Color-difference equation	ΔE*ab (CIE 1976), ΔE*94 (CIE 1994), ΔE00 (CIE 2000), ΔE (Hunter), CMC (l: c)	
Pass/fail judgment	Tolerances can be set to colorimetric values (except Munsell), color-difference values, or reflectance index values	
Storable data	Measurement data: 4,000 measurements; Target color data: 1,000 measurements	
USB memory stick* storage	Storage of measurement data and target color data. Storage/reading of measurement condition settings	
Power	AC 100 to 240 V, 50/60 Hz (using exclusive AC adapter)	
Size	Slide cover closed: 385 (W) × 192 (H) × 261 (D) mm Slide cover open: 475 (W) × 192 (H) × 261 (D) mm	
Weight	Approx. 5.8 kg	
Operating temperature/ humidity range	13 to 33°C, relative humidity 80 % or less (at 33°C) with no condensation	
Storage temperature/ humidity range	0 to 40°C, relative humidity 80 % or less (at 35°C) with no condensation	

* Security-enabled USB memory sticks cannot be used.

SAFETY PRECAUTIONS

For correct use and for your safety, be sure to read the instruction manual before using the instrument.

- Always connect the instrument to the specified power supply voltage. Improper connection may cause a fire or electric shock.

The specifications and drawings given here are subject to change without prior notice.

- If you have any questions about specifications, please contact your Konica Minolta representative.

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Certificate No : JQA-E-80027
Registration Date : March 12, 1997

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KONICA MINOLTA

Spectrophotometer CM-5

An advanced all-in-one spectrophotometer with innovative operation to let anyone take measurements easily anytime

NEW

Mini Petri Dish (optional accessory) enables measurements of small sample amounts.

- Automatic white calibration compatible.

The CM-5 makes color measurements simple. Just switch it on and start taking measurements. No need to bother with a computer; the CM-5 has a full range of advanced functions including specialized indices for a variety of applications and a large color display that makes results easy to read.

Finally, high accuracy and ease of use in a compact top-port spectrophotometer!

Giving Shape to Ideas

Measurements as simple as 1-2-3!

Switch on power.

The CM-5 starts up and ***automatically performs white/100% calibration**** using an internal white calibration plate behind the shutter.

* Not applicable to liquid transmittance measurements using cells.

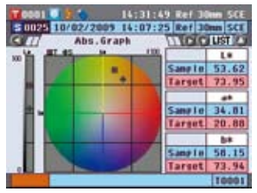
Position sample.

For reflectance, the ***top port*** makes measuring samples of various shapes and sizes easy. For transmittance, sliding open the CM-5 reveals a ***large transmittance chamber***. Liquids can be measured using optional cells.

Press MEAS.

The measurement is taken and the results appear in the display. The ***large color LCD*** enables data to be shown not only numerically, but also on the colorimetric plots and spectral graphs that normally require a computer to display.

Actual CM-5 screens!



Colorimetric plot

Spectral reflectance graph

Screens can be shown in any of ***8 languages:*** English, Japanese, German, French, Italian, Spanish, Simplified Chinese, and Portuguese.

Just follow the wizard!

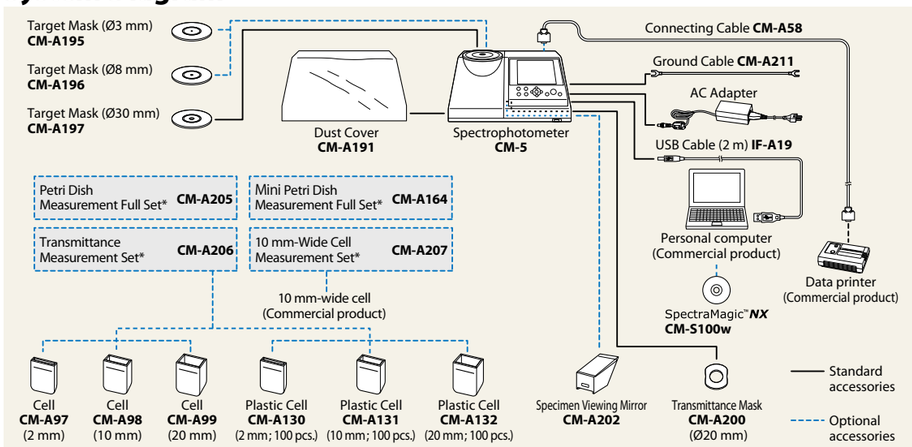
Even beginners can take measurements easily without mistakes.

The CM-5's ***wizard mode*** guides users through each step, helping users to make settings and take measurements without having to get out the instruction manual each time.

Avoid multi-user confusion with USB!

Do many people in your lab use the same instrument? The CM-5 helps eliminate that confusion by letting users store their own settings on their own USB memory stick, so they can restore the settings they need by simply reading from the memory stick instead of going through and redoing settings individually. Afterwards when they're finished, they can store measurement and target data on the same USB key and take it with them for further analysis.

System Diagram



* For details, refer to the following table.

		Petri Dish Measurement Full Set CM-A205	Mini Petri Dish Measurement Full Set CM-A164	Transmittance Measurement Set CM-A206	10 mm-Wide Cell Measurement Set CM-A207
White Calibration Plate (with CD-ROM containing calibration data and data-setting software)	CM-A210	○	○		
Zero Calibration Box	CM-A124	○	○		
Target Mask (for Petri Dish)	CM-A203	○			
Petri Dish	CM-A128	○			
Calibration Glass (for Petri Dish)	CM-A212	○			
Target Mask (for Mini Petri Dish)	CM-A158		○		
Mini Petri Dish	CM-A157		○		
Calibration Glass (for Mini Petri Dish)	CM-A159		○		
Transmittance Zero Calibration Plate	CM-A213			○	
Transmittance Specimen Holder	CM-A96			○	
Transmittance Specimen Holder Attachment	CM-A199			○	
Transmittance Specimen Holder (10mm-wide cells)	CM-A198				○
Transmittance Zero Calibration Plate (10mm-wide cells)	CM-A204				○
Accessory Case	CM-A193	○	○	○	

Petri Dish Measurement Full Set **CM-A205**

Mini Petri Dish Measurement Full Set **CM-A164**

Transmittance Measurement Set **CM-A206**

10mm-Wide Cell Measurement Set **CM-A207**

Compact, versatile color instrument

Reflectance measurements

The measuring port of the CM-5 is on top, so users can just place a solid object on the port and press the MEAS. button. There's no need to clamp the sample in a sample holder, and there's no worry about the sample shifting position.
And, by using a Petri dish (optional accessory), liquids, pastes, and powders can also be measured easily.

Samples are just placed on top, so even large samples can be measured.

By using the Ø3mm target mask (optional accessory), even small samples can be measured.

Pastes can also be measured using a Petri dish (optional accessory).

Colorant pellets can be measured in raw form using a Petri dish (optional accessory).

Ø16mm Mini Petri Dish for small sample amounts (Optional accessory)

The optional Mini Petri Dish enables measurements of costly powder samples such as rare-earth metals, organic EL materials, pharmaceuticals, etc. to be taken using much less sample material (approximately 1/20 of amounts required using our conventional Petri Dish CM-A128). In addition, the automatic white calibration function also works with the Mini Petri Dish, so measurements can be taken shortly after switching the instrument on without performing calibration manually.

Transmittance measurements

The CM-5's transmittance chamber is large and sideless, enabling measurements of even large sample sheets with thicknesses up to 60mm.

For liquids, optional cells with 3 optical path lengths for different sample densities are available, and commercial 10mm-wide cells can also be used.

Internal calibration curves for measuring standard chemical/pharmaceutical indices

The CM-5 can measure several of the standard color indices commonly used in the chemical and pharmaceutical field: Gardner, Hazen/APHA, Iodine Color Number, European Pharmacopoeia and US Pharmacopeia (equivalent to Japanese Pharmacopoeia color indices). Calibration curves*1 for these indices are stored in the CM-5, so measurements of samples based on these indices can be performed quickly and easily by anyone.

*1 Index calibration curves were measured using 10mm-Wide Cell Measurement Set CM-A207 and commercially available 10mm-wide cells with 10mm optical path length.

Spectral absorbance measurements

Spectral absorbance can now be measured and displayed numerically or graphically, enabling evaluation of spectral absorbance for checking absorbance wavelengths, evaluating colorants, calculating K/S, determining components, etc.