



KONICA MINOLTA

# SPECTROPHOTOMETER CM-3600d / CM-3610d

Built for Precision,  
Priced for Economy



## Outstanding Performance through Innovative Technology

### CM-3600d Horizontal Spectrophotometer

- Highly accurate, reliable and rugged
- Versatile instrument for most colorimetric applications
- Simplified operation.

### CM-3610d Vertical Spectrophotometer for best application support

- Speeds up textile and paper measurements
- Ideal for non contact measurements such as powders, pigments
- Quick sample handling and observation

The essentials of imaging

# CM-3600d and CM-3610d Spectrophotometer: Highest Quality in Color Measurement in the Laboratory and for Production

## Enhanced Performance Technology Konica Minolta Innovative Optical System

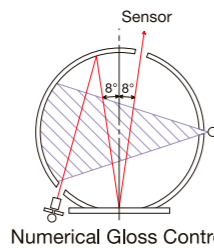
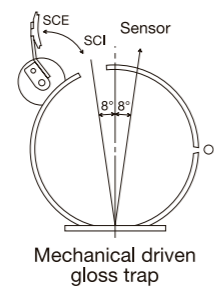
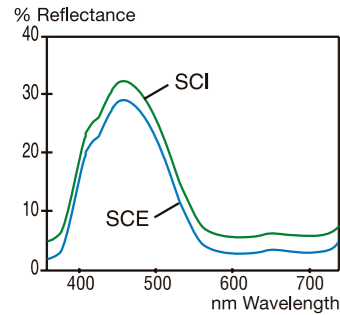
The CM-3600d and CM-3610d are equipped with Konica Minolta Innovative Optical System technology. For users, this means high accuracy and repeatability, improved performance, additional features, simple operation, and - low, affordable pricing.

This technology also provides:

### 1. Numerical Gloss Control

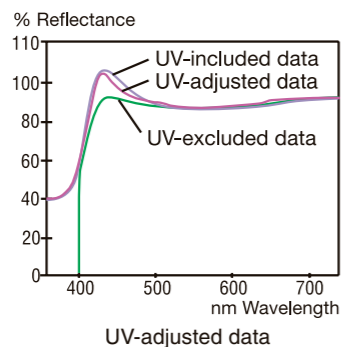
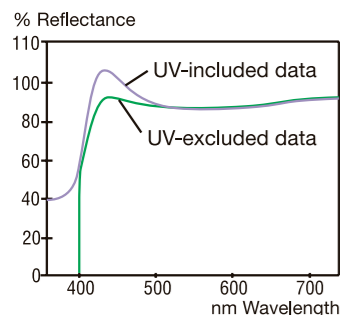
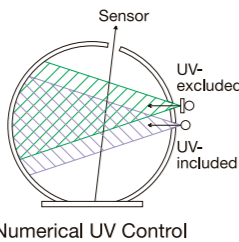
Instead of using a mechanically driven gloss trap, the CM-3600d and CM-3610d feature a patented numerical Gloss (SCI/SCE) control system. By sequentially firing two flashes, within a few seconds the system provides both SCI and SCE values for each sample.

SCI specular component included  
SCE specular component excluded



### 2. Numerical UV Control

To replace the time-consuming traditional UV measurement system that utilizes moving filters, the CM-3600d introduces yet another patented numerical calculation system, which is also part of the CM-3610d. The measured values of two sequentially fired flashes, one with full UV energy and one with UV cut-off filter at either 400 or 420 nm are combined to obtain the spectral characteristics, and the respective whiteness and tint value of any UV-activated fluorescence sample. To avoid triplet effect on FWA treated samples, the CM-3600d and CM-3610d can be set to Soft-Flash mode. Numerical UV Control technology makes faster, more effective and reliable measurements of FWA treated materials such as textiles, papers and detergents.



### For high-accuracy color control The newly designed Monolith Polychromator Unit

consists of a diffraction grating with a full wavelength range, 360-740 nm, at 10nm pitch, and 10nm half-band width, both for sample and reference light, and dual-channel sensor array.

### Full range of application coverage

Whatever your sample looks like, with the CM-3600d you can measure it! Reflectance of opaque samples, Transmittance of transparent liquids or solids and Diffuse Transmittance of translucent materials such as plastics - the CM-3600d is truly versatile.



Transmittance Measurement-The CM-3600d employs the d/0° geometry (diffused lighting, 0° viewing), which conforms to ISO, DIN, CIE, and ASTM standards.

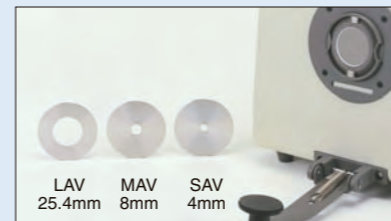
Reflectance Measurement-The CM-3600d employs d/8° geometry (diffused lighting, 8° from normal viewing) which conforms to JIS7 ISO, DIN, CIE and ASTM standards.

### Konica Minolta Innovative Optical System Technology

Konica Minolta's Innovative Optical System, including Numerical Gloss Control and Numerical UV Control, opens the way to unlimited application versatility at a price level never seen before.

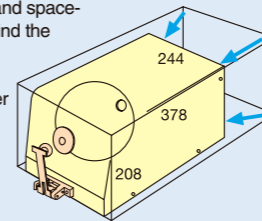
### Multiple measurement area selection

To cover all kinds of samples, the CM-3600d gives you the choice among three aperture sizes: LAV 25.4mm, MAV 8mm and SAV 4mm with precise measurement spot adjustment by a motorized observing lens.



### Compact but yet Powerful

Behind the compact and space-saving design, you'll find the skills of a top-class instrument with 6" large sphere and other functions so far only found in much larger and more expensive instruments.



### Maintenance free technology and ruggedness concept

The CM-3600d is equipped with maintenance-free technology and solid state components to withstand rugged conditions. The monolith polychromator unit assures highest durability and stability. With one exception (Observing Lens), the CM-3600d does not use any moving parts. Furthermore, each CM-3600d passes a hard endurance test program to comply with KONICA MINOLTA's highest quality standards in accordance with ISO-9001.

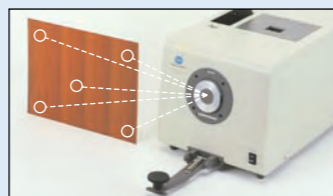
### Bright and clear sample viewing system

The retro mirror's reflected and illuminated sample viewing screen minimizes fatigue and allows trouble-free sample observation.



### Designed to meet your highest ergonomic expectations

The compact and space-saving body as well as all functions of the CM-3600d have been designed to ensure easy and fatigue-free operation in daily use. The bright mirror sample viewing system, the sample holder for up to A4 size samples with full 90° lock down, and the versatile Transmittance chamber for liquid or translucent samples are all just where you expect them to be for easy operation.



### Performance

- Fast, simultaneous measurement of Specular Included and Specular Excluded components (SCI/SCE)
- Fast, Instantaneous numerical UV adjustment enables UV-included, UV-excluded, and UV-adjusted data to be obtained simultaneously
- Precise inter-instrument agreement. All CM-3600d spectrophotometers meet published inter-instrument agreement.

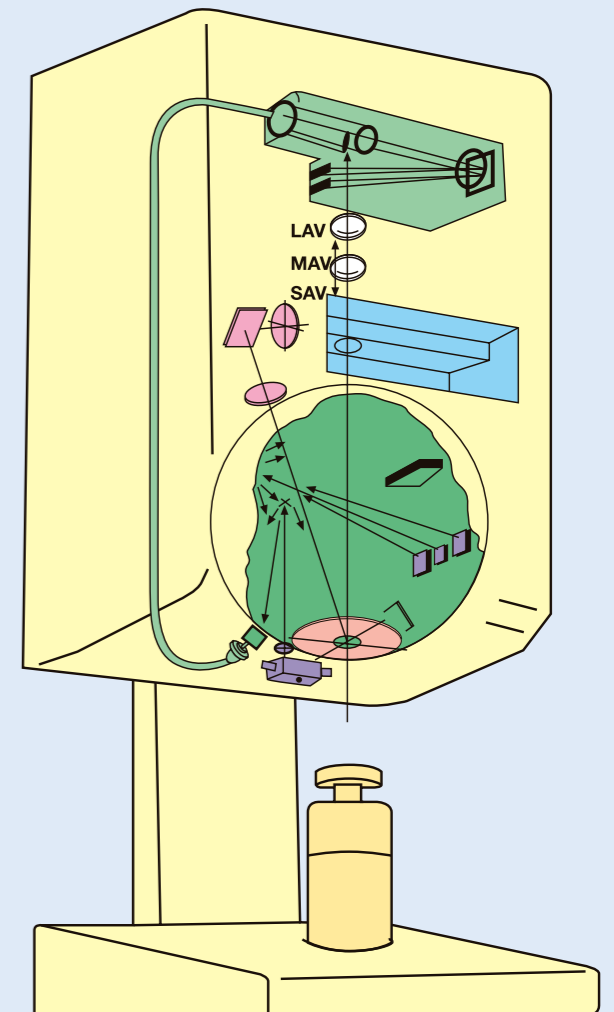
### Versatility

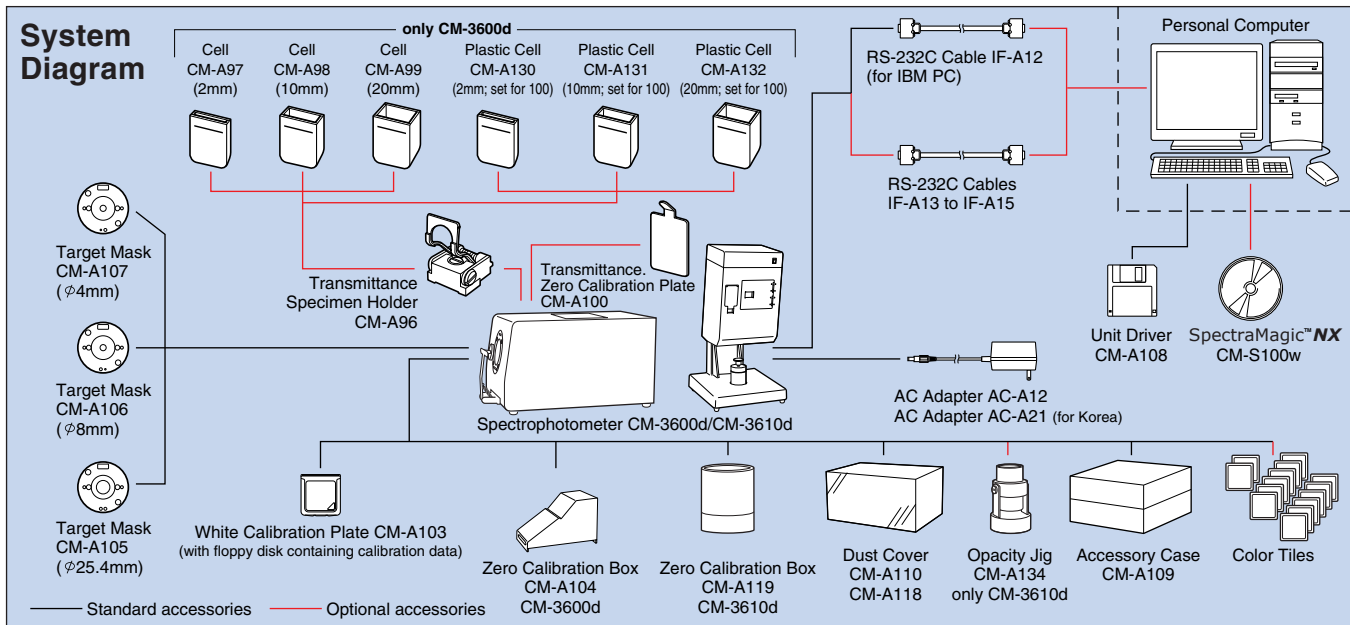
- Full wavelength range 360-740nm with 10nm pitch
- Large (6") sphere; d/8° geometry
- Reflectance and transmittance sample measurements
- Changeable measurement areas (ø4mm, ø8mm, or ø25.4mm)
- View finder design for easy sample viewing
- Compact and lightweight

### Reliability

- High reliability design with fewest moving parts of any benchtop spectrophotometer

## CM-3610d Vertical Model





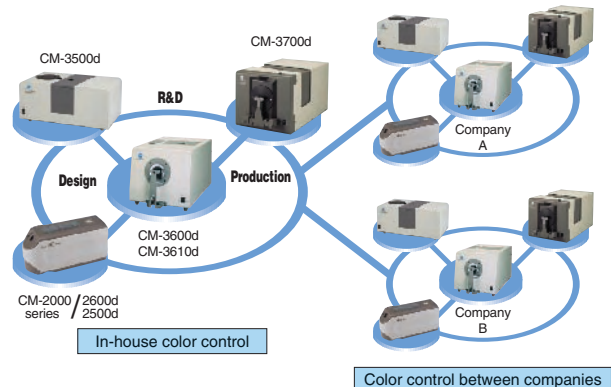
### Specifications

<b>Illumination/Observation system</b>	Reflectance; d/8 (diffused illumination, 8-degree viewing), equipped with simultaneous measurement of SCI (specular component included) / SCE (specular component excluded) Conforms to CIE No.15, ISO7241, ASTM E1164, DIN5033 Teil7 and JIS Z8722 condition C standard. Transmittance : d/0 (diffused illumination, 0-degree viewing) Conforms to CIE No.15, ASTM E1164 and DIN5033 Teil7 standard.
<b>Light-receiving element</b>	Silicon photodiode array (dual 40 elements)
<b>Spectral separation device</b>	Diffraction grating
<b>Wavelength range</b>	360 to 740nm
<b>Wavelength pitch</b>	10nm
<b>Half bandwidth</b>	Approx. 10nm
<b>Reflectance range</b>	0 to 200%; resolution: 0.01%
<b>Sphere size</b>	φ152mm
<b>Light source</b>	4 pulsed xenon lamps
<b>Measurement time</b>	Approx. 1.5 seconds
<b>Minimum interval between measurements</b>	Approx. 5 seconds
<b>Measurement/illumination area</b>	LAV : φ25.4mm/φ30mm MAV : φ8mm/φ11mm (Selectable) SAV : φ4mm/φ7mm
<b>Repeatability</b>	Spectral reflectance: Standard deviation within 0.1% Colorimetric values: Standard deviation within ΔE*ab0.02
<b>Inter instrument agreement</b>	Mean ΔE*ab0.15 (SCI) Average for 12 BCRA Series II color tiles compared to values measured with master body.
<b>Temperature dependence</b>	Spectral reflectance: Within ±0.10%/°C Color difference: Within ΔE*ab 0.05/°C
<b>UV adjustment</b>	Instantaneous numerical adjustment
<b>UV cut filter</b>	400nm cutoff and 420nm cutoff
<b>Transmittance chamber</b>	Width: 133mm; depth: approx. 50mm; measurement dia.: approx. 17mm Transmission sample holder (Optional accessory): Sample holder for both plate-shaped and liquid samples (removable)
<b>Interface</b>	RS-232C, D-SUB 9-pin (female) terminal
<b>Power</b>	AC120V/230V 50/60Hz (Using included AC adapter)
<b>Operating temperature/humidity range (*1)</b>	13 to 33°C, relative humidity 80% or less (at 33°C) with no condensation
<b>Storage temperature/humidity range</b>	0 to 40°C, relative humidity 80% or less (at 33°C) with no condensation
<b>Size (W x H x D)</b>	CM-3600d 244 x 208 x 378 mm, CM-3610d 300 x 597 x 315 mm
<b>Weight</b>	CM-3600d 12 kg, CM-3610d 16.5 kg

\*1 Operating temperature/humidity range of products for North America : 13 to 33°C, relative humidity 80% or less (at 31°C) with no condensation

### Network construction for color control either within an organization or between organizations

High inter-instrument agreement between the same Konica Minolta model and also among all CM models (benchtops and portables): CM-2000 series, CM-3000 series, This inter-instrument agreement is ideal when multiple units will be used for color control either within an organization or between organizations.



### KONICA MINOLTA SPECTROPHOTOMETER LINEUP

<b>CM-3700d series</b>	"State of the Art" Reference models
<b>CM-3600d</b>	Laboratory and Production Model(horizontal)
<b>CM-3610d</b>	Laboratory and Production Model(vertical)
<b>CM-3500d</b>	Unique Top Port bench-top model
<b>CM-2600d/2500d/2500c</b>	Top class accuracy portables

### 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.



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Registration Date : March 3, 1995

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

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