



KONICA MINOLTA

# SPECTROPHOTOMETER CM-3600d

Built for Precision,  
Priced for Economy



**New Enhanced Performance Technology** teams patented performance features with simplified design and advanced cost-reducing manufacturing techniques.

**The result:**

- A highly accurate, reliable, rugged spectrophotometer.
- Versatile enough for all colorimetric applications.
- Simplified operation.

**And**

- LOW PRICE

## Technology

**KONICA MINOLTA Innovative Optical System "World first" technology :**

- Numerical Gloss Control measurement within a few seconds.
- Numerical UV Control for calibration and measurements.
- Soft-flash mode to avoid triplet adsorption in fluorescent materials.

The essentials of imaging

# The Innovative CM-3600d Spectrophotometer Brings You Highest Quality Levels in Color Measurement along with Unsurpassed Versatility, User Comfort and Low Cost!

## Enhanced Performance Technology Konica Minolta Innovative Optical System

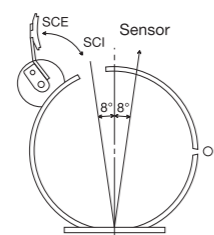
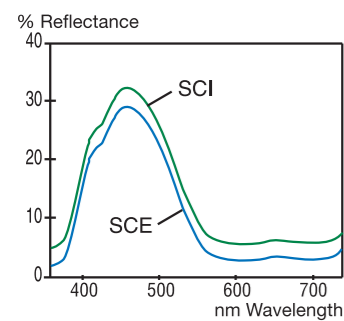
The CM-3600d is equipped with Minolta Innovative Optical System technology. For users, this means high accuracy and repeatability, improved performance, additional features, simple operation, and - low, affordable pricing.

This technology also provides:

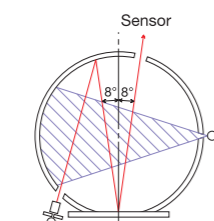
### 1. Numerical Gloss Control

Instead of using a mechanically driven gloss trap, the CM-3600d is equipped with 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



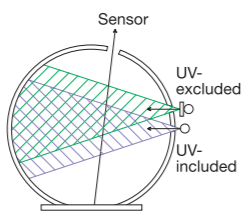
Mechanical driven gloss trap



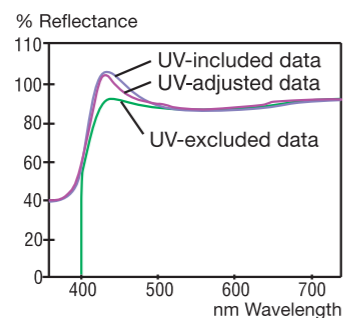
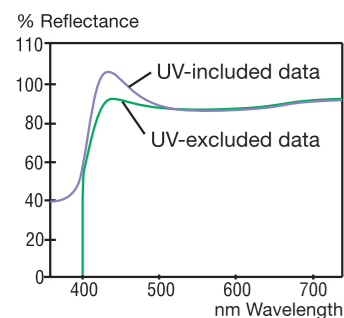
Numerical Gloss Control

### 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, never seen before: 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 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.



Numerical UV Control



UV-adjusted data

### 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.

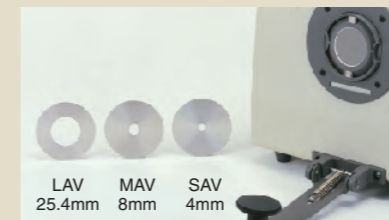
Reflectance Measurement-The CM-3600d employs d/8° geometry (diffused lighting, 8° from normal viewing) which conforms to JIS, ISO, DIN, CIE and ASTM standards.

### 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.

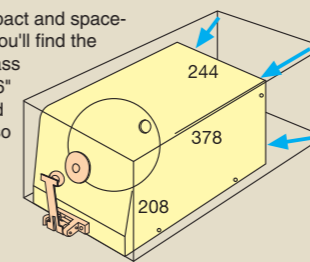
### Multiple measurement area selection

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.

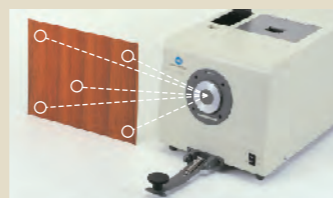
### Bright and clear sample viewing system

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's meet published inter-instrument agreement.

### Versatility

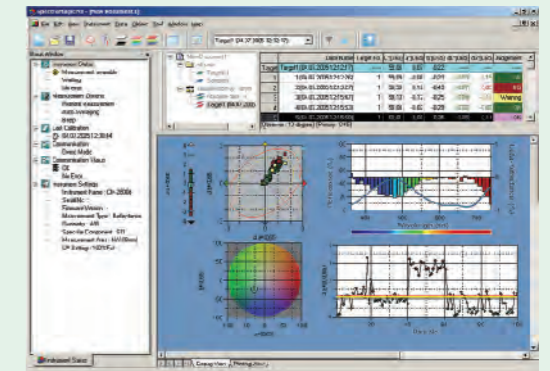
- Full wavelength range 360-740nm with 10nm pitch
- Large (6") sphere; d/8° geometry
- Reflectance and transmittance sample measurements
- Changeable measurement areas (ø4mm, ø8mm, or ø25.4mm)
- View finder design for easy sample viewing
- Compact and lightweight

### Reliability

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

## SpectraMagic™ NX (Optional)

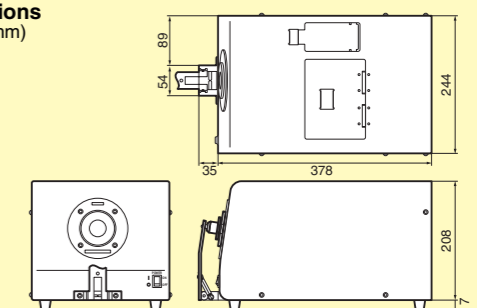
Supports Windows®2000/XP

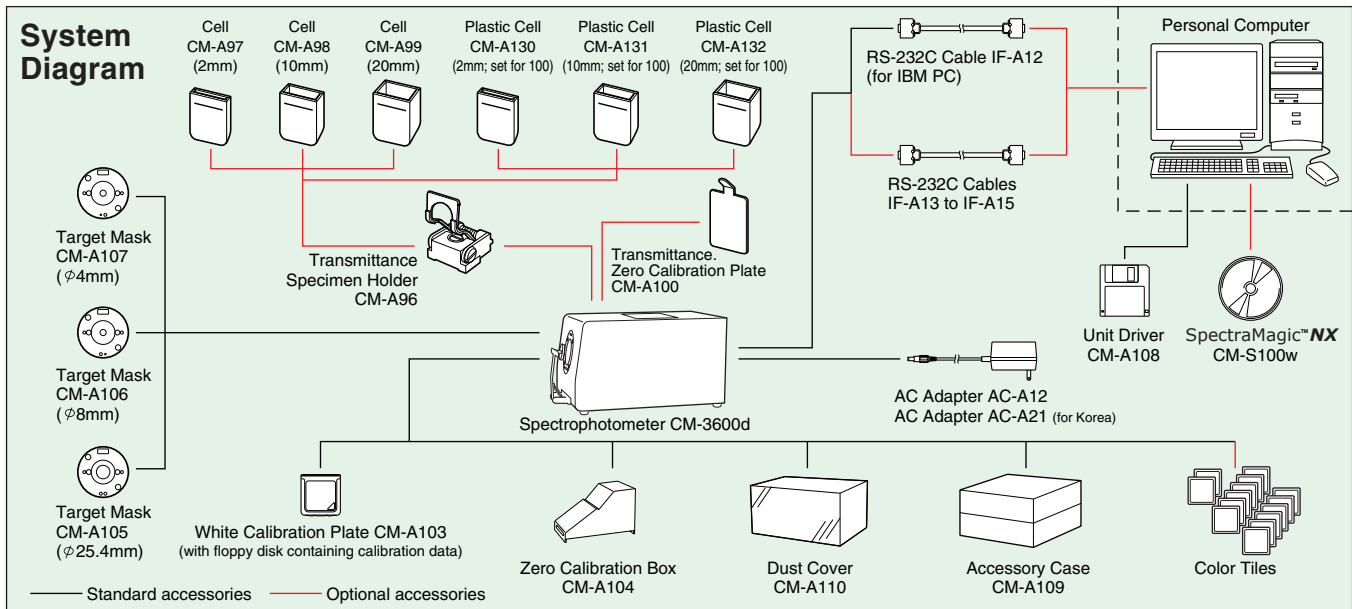


SpectraMagic™ NX enables you to perform comprehensive color inspection and analysis of incoming raw materials, in process production, and outbound color critical goods and materials in virtually any industry. With SpectraMagic™ NX you can insert digital images with measured data. Measure samples in any of 8 universally accepted color spaces. Select from 15 illuminants, and up to 40 indices to determine specific color and appearance properties, such as strength, brightness, haze, yellowness, opacity and strength. You can even configure up to 3 customized color equations. Reports range from simple Pass/Fail to trend charts, histograms, color plots, and spectral graphs. SpectraMagic™ NX comes with predefined templates using skin technology, or you can create your own templates. For illustrations and explanations to understanding color and color measurement technology, there is a link to Konica Minolta's well known and respected "Precise Color Communication". Step by step navigation help. SpectraMagic™ NX conforms to FDA 21 CFR Part 11 assuring integrity and reliability of data records.

• Windows® is a trademark of Microsoft Corporation in the USA and other countries.

### Dimensions (Units:mm)





### 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, ISO7724/1, 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>	Pulsed xenon lamps (X4)
<b>Measurement time</b>	Approx. 1.5 seconds
<b>Minimum interval between measurements</b>	Approx. 4 seconds; when SCI/SCE measured
<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 (LAV/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)/weight</b>	244 x 208 x 378 mm (9-5/8 x 8-3/16 x 14-7/8 inch), 12 kg (26-7/16 lb.)
<b>Standard accessories</b>	White Calibration Plate, Target Mask (φ4mm), Target Mask (φ8mm), Target Mask (φ25.4mm), Zero Calibration box, AC adapter, Dust Cover, Accessory Case, Unit Driver, RS-232C Cable (9-pin, 2m)
<b>Options</b>	SpectraMagic™ NX (software), Transmittance Specimen Holder, Cell (2mm) / (10mm) / (20mm), Transmittance Zero Calibration Plate, RS-232C Cable (IBM, PC/AT 5m) / (IBM, PS/2 2m) / (IBM, PS/2 5m)

\*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

### SAFETY PRECAUTIONS

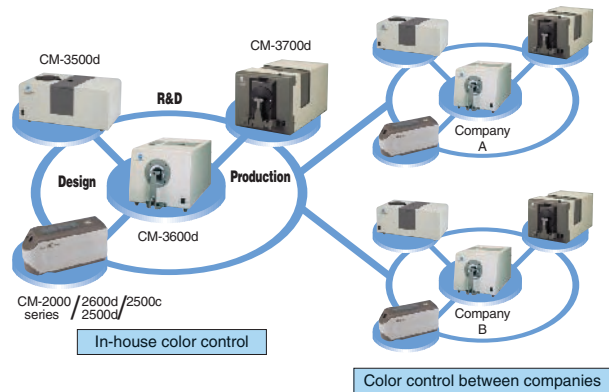
For correct use and for your safety, be sure to read the instruction manual before using the instrument.



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

### 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

- CM-3700d series** "State of the Art" Reference models
- CM-3600d** Laboratory and Production model
- CM-3500d** Unique Top Port bench-top model
- CM-2600d/2500d/2500c** Top class accuracy portables



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Registration Date : March 3, 1995

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

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