



Applications for Vehicle Evaluation  
**Color and Light Measuring Instruments**



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### 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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<https://konicaminolta.com/instruments/network>

# Vehicle evaluation application examples

■ Object color ■ Light source color

**Appearance**

**TAMS™**

**Exterior paint**  
(Orange Peel / Distinctness of Image)

**Appearance analyzers**  
Rhopoint IQ-S **DOI**  
Rhopoint IQ Flex20 **DOI**

**Automotive window glass**

**Spectrophotometer CM-700d**  
(Spectral reflectance measurement of glass)  
**Spectrophotometer CM-5**  
(Spectral transmittance measurement of glass)

**Door mirrors Door handles** **Side mirror warning indicators**

**Spectrophotometer CM-M6** **2D luminance colorimeter LumiCam 2400B**

**Brake lamps, signal lamps, fog lamps, hazard lamps, etc.**

**Illuminance colorimeter CL-200A** (For vehicle inspections)  
**Spectroradiometer CAS 140D**

**License plates**

**Spectrophotometer CM-700d**



**Exterior paint**  
(Metallic pearlescent, etc.)

**Spectrophotometer CM-M6**

## EXTERIOR [Exterior paint]

**Headlamps (High illuminance)**

**Illuminance meter T-10A** (Multi-point measurement)  
(For light distribution measurement)  
**2D luminance colorimeter LumiCam 2400B Color/Advanced**  
(For light guide measurement)

**Aluminum wheels** **Tires**

**Appearance analyzer Rhopoint IQ Flex20** **Gloss, Haze**  
**Colorimeter CR-400**



Dashboards, Interior parts



Spectrophotometer **CM-700d**  
(Color control of interior parts with curved surfaces and shapes)



Spectrophotometer **CM-25cG Gloss**  
Spectrophotometer **CM-26d/CM-25d**  
(Color control of parts with differing textures)



Glossmeters  
**MULTI GLOSS 268A/UNI GLOSS 60A Gloss**



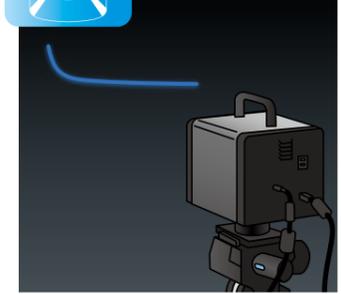
Interior illumination: Ceilings, etc.



Spectroradiometer **CL-500A**  
Spectroradiometer **CAS 140D**  
Illuminance meters **T-10MA**  
(Multi-point measurement)



Interior illumination: LED strip lights



2D colorimeter luminance colorimeters  
**CA-2500A**  
**CAS 140D**



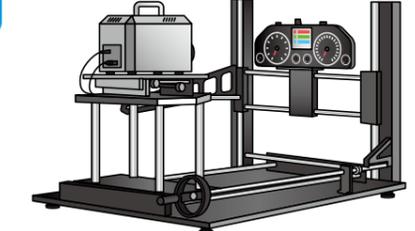
Mirrors (Interior)



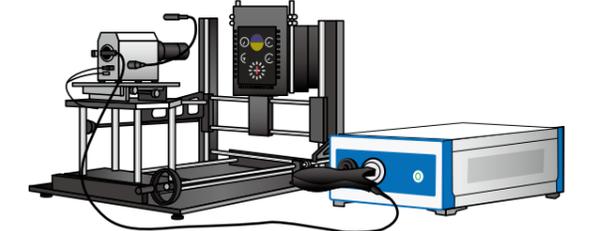
Spectrophotometer **CM-700d**  
(For surface reflectance measurement)



Instrument panels



2D luminance colorimeters  
**LumiCam 2400B Color/Advanced**



Display Test System  
**DTS 140**



Piano Black finish

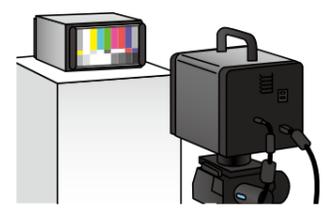


Spectrophotometer **CM-25cG Gloss**  
Spectrophotometer **CM-26d/CM-25d**  
Appearance analyzer  
**Rhpoint IQ-S Gloss, Haze**

# INTERIOR [Car Interiors]



Car navigation/Central information displays



2D luminance colorimeters **CA-2500A**  
**LumiCam 2400B Color/Advanced**  
(For black mura evaluation)



Display Color Analyzer **CA-410**



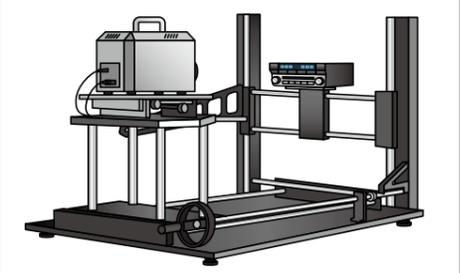
Spectral radiance system **DTS 140**  
Spectroradiometer **CS-2000A**



Spectrophotometer **CM-700d**  
(For surface reflectance measurement)  
Appearance analyzer  
**Rhpoint IQ-S Gloss**



Uneven illumination of AC/audio switches



2D luminance colorimeters  
**LumiCam 2400B Color/Advanced**  
Spectral radiance system **DTS 140**  
Spectroradiometer **CS-2000A**



Steering wheels



Spectrophotometer  
**CM-700d**



Car seats and ceiling materials



Colorimeter  
**CR-410**



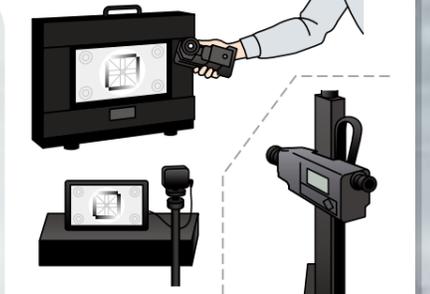
Interior door trim



Spectrophotometer  
**CM-700d**



Vehicle-mounted cameras



Spectroradiometer **CL-500A**  
Colorimeter **CL-200A**  
(Environmental evaluation/ Calibration light source evaluation)  
Luminance colorimeter **CS-200**  
(Camera light source evaluation)



Brightness and chromaticity checks of light sources  
(Handheld for field measurement)



Luminance meters **LS-150/LS-160**  
Luminance colorimeters **CS-150/CS-160**



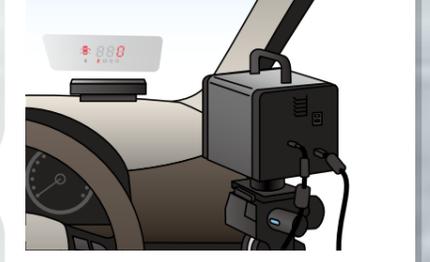
Plated parts  
(Curved/Small surfaces)



Appearance analyzers  
**Rhpoint IQ Flex20 Gloss, Haze**  
**Rhpoint IQ-S Gloss, Haze**



Head-up displays



2D luminance colorimeter **CA-2500A**  
Display Test System **DTS 140**

Laser light source measurement



High-resolution spectral measurement  
**CAS 140CT-HR**  
**CAS 120-HR**

## Object color

### Spectrophotometers

#### CM-700d / CM-600d

These easy-to-operate handheld spectrophotometers condense the latest optical technologies from Konica Minolta plus the high precision and functionality of Konica Minolta's benchtop models into a low-cost, compact and highly portable size. They are perfect for measuring colors of automotive interiors. Offers both  $\varnothing 8$  and  $\varnothing 3$  mm measurement areas. (CM-700d)



#### CM-25cG

This 2-in-1 model simultaneously measures chromaticity and gloss. Its form and function are suited for managing the color and gloss of vehicle interiors. Moreover, it offers two different measurement areas.

Color  $\varnothing 8$  mm /  $\varnothing 3$  mm  
Gloss  $\varnothing 10$  mm /  $\varnothing 3$  mm



#### CM-26dG

The next generation of portable sphere spectrophotometer, offering unprecedented accuracy/inter-instrument agreement (IIA), usually reserved for laboratory-grade instrumentation. Featuring a horizontal alignment for easily measuring flat or large samples in narrow spaces.



#### CM-M6

Compact, lightweight model for multiple (6) angle measurement. The vertical body incorporates a "Double-Path Optical System" that can stably measure curved surfaces and small targets, making it the tool of choice for measuring exteriors.

Measurement area:  $\varnothing 8$  mm



#### CM-3700A

This reference spectrophotometer packages Konica Minolta's state-of-the-art optical technologies to ensure high accuracy. It is a wise choice for users who apply stringent controls in their pursuit of high quality.



#### CM-36dG

This spectrophotometer has an integrated  $60^\circ$  gloss sensor inside to measure color and true gloss simultaneously while also including several new features to improve the user experience. By measuring and reporting both values together, you can streamline your quality control workflow, reduce operator errors, and save on equipment and maintenance costs.



#### CM-5

Despite being compact in size and light in weight, this all-in-one spectrophotometer comes with a top port and a large color LCD that simplifies sampling, measurement and analysis. It is perfect for measuring the transmittance of windshield glass before installation.



### Colorimeters

#### CR-400

Top-seller around the world. De facto standard in handheld colorimeters.  $\varnothing 8$  mm measurement area.



#### CR-410

This handheld colorimeter features a wide aperture that is highly suited for measuring samples with uneven surfaces or patterns.  $\varnothing 50$  mm measurement area.

### Appearance analyzers

#### Rhpoint TAM™

Rhpoint TAM™ is a new way of quantifying appearance quality inspired by a four-year collaboration between Rhpoint, Volkswagen AG and AUDI AG. This innovative new technology models the human perception of surface appearance quality, providing new parameters that revolutionize the understanding and communication of visual appearance information.



#### Rhpoint IQ-S / IQ Flex / Flex 60

These meters can measure gloss, reflection haze, image clarity and spec. The Rhpoint IQ-S series is capable of evaluating reflectance characteristics and surface conditions that conventional glossmeters cannot. The IQ Flex features a small aperture probe for measuring small components and curved surfaces.



## Light source color

### Illuminance meters, luminance meters and spectroradiometers

#### CL-500A

The CL-500A can be used to inspect and control the quality of indoor LED lighting. As a handheld device, it facilitates measurements around door steering wheels, under seats and other hard-to-get-to vehicle interiors locations. It is lightweight, compact and suited for color-rendering index evaluation of light sources, and conforms to both JIS and DIN. The CL-500A can measure and display the color rendering index, photopic illuminance (lx), scotopic illuminance (lx), correlated color temperature (K) and chromaticity (xy) of light sources.



### Colorimeter

#### CL-200A

This compact and lightweight colorimeter is perfect for measuring the chromaticity of white LEDs. It can measure and display the correlated color temperature (K), chromaticity (xy), photopic illuminance (lx), tristimulus values (XYZ), dominant wavelength and excitation purity of light sources.



### Illuminance meters

#### T-10A/T-10MA

These highly accurate illuminance meters conform to JIS Class AA and DIN Class B. They can accurately measure next-generation PWM-controlled lighting sources. They can also be incorporated into testing systems for multi-point measurements.



### Spectral luminance measurement systems

#### DTS 140 ■

This system uses a telescopic probe to measure the spectral luminance of displays in vehicles. It can measure microscopic areas as small as  $\varnothing 75$   $\mu$ m.



### Spectroradiometers

#### CS-2000A / CS-2000

This spectroradiometer employs Konica Minolta's proprietary optical design and signal processing technologies to accurately measure luminance as low as  $0.0005$   $\text{cd}/\text{m}^2$  and chromaticity.



#### CAS Series ■

Our series of high-end spectroradiometers each present innovative features that allow the systems to be used universally in a broad range of applications and functions. These systems conveniently change into spectroradiometers when users attach absolute calibration and optical probes. The high-resolution (HR models) spectroradiometers combine the demands of high spectral resolution and short testing times for sophisticated and price-sensitive measurement tasks in production and laboratory environments and are offered with a PTB traceable calibration.



### Luminance colorimeters

#### CS-200

This luminance colorimeter adopts a spectral fitting method to measure luminance and chromaticity to a degree of accuracy near to that of spectroradiometers.



#### CS-150 / CS-160

These luminance colorimeters are designed and built for ease of use and accuracy. They are compact, lightweight, easy to operate and capable of measuring an area of  $\varnothing 4$  mm (CS-160).



### Luminance meters

#### LS-150 / LS-160

These luminance meters are designed and built for ease of use and accuracy. They are capable of measuring luminance of about  $1,000,000$   $\text{cd}/\text{m}^2$  (LS-160).



### Display color analyzer

#### CA-410

This analyzer can measure the luminance and chromatic flicker of vehicle-mounted displays used for car navigation systems, etc. at high speed and to a high degree of accuracy.



### 2D luminance colorimeters

#### CA-2500A

This analyzer measures the luminance mura and chromaticity mura of vehicle-mounted displays in 2 dimensions at high resolution. It is suited for development and testing since it can perform measurements, analyses and evaluations very efficiently in a short amount of time. It can accommodate targets of varying size owing to a wide array of interchangeable lenses.



### LumiCam Series ■

Our imaging photometers and colorimeters are designed to handle a large variety of applications and functions. They utilize rapid capture technology to get a complex reading of color distributions and luminance very quickly. Easy integration into existing applications with minimal training to operate. Our software makes analyzing the collected data simple in both two-dimensional and three-dimensional spaces. Ideal for versatile automotive test applications, e.g. measurement of luminance and color distributions of displays and control elements or uniformity analysis of flat panel displays.



### LumiTop Series ■

The LumiTop Series combines the accuracy of the well-known CAS Series with the obvious advantages of imaging colorimetry. Our innovative design merges an RGB camera and a flicker diode with the high-end spectroradiometer CAS140CT/D. Using the extremely accurate spectral information of the CAS140 measurements as reference guarantees spectroradiometric precision across the whole 2D image.



### Display Measurement System

#### DMS Series ■

The DMS series is recognized as a worldwide standard and reference for extensive analyses of electro-optical displays, related materials and components at every stage of the engineering and production process. It consists of four individual goniophotometric systems, varying in size and function. All DMS systems enable measurement of luminance, contrast and chromaticity under different display driving states and viewing directions, determination of flicker and response time, and qualification of environmental impacts as ambient illumination and temperatures

