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# **CHROMA METER**

## **CR-200b**



**MINOLTA**

The Minolta Chroma Meter CR-200b is a lightweight, compact tristimulus color analyzer for measuring reflected-light color. It combines advanced electronic and optical technology in a handheld unit to provide high accuracy and complete portability. Using an 8mm measuring area, diffuse illumination, and a 0° viewing angle, the CR-200b can take accurate color measurements of a wide variety of subjects. Readings can be taken quickly and easily, making this meter ideal for spot-checking of color on production lines and in the field.

A pulsed xenon arc (PXA) lamp in a mixing chamber provides diffuse, even lighting over the sample surface. Six high-sensitivity silicon photocells, filtered to match the CIE (*Commission Internationale de l'Eclairage*) Standard Observer response, are used by the meter's double-feedback system to measure both incident and reflected light. The CR-200b thus detects any slight variation in the spectral power distribution of the PXA lamp, and compensates automatically.

Chromaticity may be measured in either Yxy (CIE 1931) or L\*a\*b\* (CIE 1976) coordinates, color difference in  $\Delta$  (Yxy),  $\Delta$  (L\*a\*b\*), or  $\Delta E^*ab$ . Data can be converted between coordinate systems or between chromaticity and color-difference measuring modes by the meter. The CR-200b also offers a choice of either CIE Illuminant C or D<sub>65</sub> lighting conditions. The meter can be calibrated to both a standard white reflective plate and a user-selected calibration surface, and a number of meters can be standardized by calibrating to the same reference surface. For hard-copy printout and greater versatility, readings may be transferred to a separate computer through the meter's data-output terminal, and the meter may also be operated by remote control.

The meter body of the CR-200b is powered by a single nine-volt battery for approximately 30,000 readings. The lighting head is powered separately by six AA-size batteries or by the AC adapter connected to an AC outlet. To conserve power, the meter has an automatic canceling feature that clears the display about three minutes after the last key has been released, but keeps the last reading in memory.

Please read and study this manual before using the Minolta Chroma Meter CR-200b for the first time, and keep it for future reference.

**Technical Details:**

**Type:** Hand-held dual-function reflected-light colorimeter with diffuse illumination/0° viewing angle

**Display:** 9-digit LCD (3 digits per variable); desired readout selectable by pressing appropriate keys before/after measurement taken; "E9" displayed when measured value out of display range

**Receptors:** 6 silicon photocells (3 to measure source illumination, 3 to measure reflected light) filtered to detect primary stimulus values for red, green, and blue light

**Spectral response:** Closely matches CIE Standard Observer curves ( $\bar{x}_\lambda$ ,  $\bar{y}_\lambda$ , and  $\bar{z}_\lambda$ )

**Measuring modes and color systems:** Yxy (CIE 1931) and L\*a\*b\* (CIE 1976) for measuring chromaticity;  $\Delta(Yxy)$ ,  $\Delta(L^*a^*b^*)$ , and  $\Delta E^*ab$  for measuring color difference

**Memory channels:** WHITE: for calibration data of standard white plate

VARI: for calibration data of user-selected surface

DIFF: For target-color data in color-difference measuring mode

**Light source:** Pulsed xenon arc lamp built into measuring head

**Illuminant conditions:** CIE Illuminant C or D<sub>65</sub>

**Illuminating/viewing geometry:** Diffuse illumination, 0° viewing angle; specular component included

**Measuring area:**  $\phi 8\text{mm}$

**Measuring range:** 1.5 to 100% reflectance; display blinks when measured value is under range

**Short-term repeatability:** Chromaticity (x, y): within +0.0005

Color difference ( $\Delta E^*ab$ ): 0.4

(Measurement subject: standard white plate; 95% of test measurements within given repeatability values from mean value of measurements)

**Terminals:** Remote-control socket, data-output terminal, AC adapter socket for light source

**Data output:** 1-bit serial, open-collector; remote-control operable

**Power source:** Meter body: One 9V battery (Eveready 216 or equivalent)

Measuring head: Six AA-size alkaline-manganese or carbon-zinc (1.5V) or nickel-cadmium (1.2V) batteries or included AC adapter connected to AC power source

**Operation temperature range:** 0 to +40°C (+32 to +104°F)

**Storage temperature range:** -20 to +55°C (-4 to +131°F)

**Dimensions:** Meter body: 47 × 76 × 202mm ( $1\frac{7}{8} \times 3 \times 7\frac{15}{16}$  in.)

Measuring head: 201 × 91 × 60mm ( $7\frac{15}{16} \times 3\frac{9}{16} \times 2\frac{3}{8}$  in.)

Connecting cord:  $\phi 8.5 \times 1300\text{mm}$  ( $\phi\frac{3}{8} \times 1\frac{3}{16}$  in.)

**Weight:** Meter body: 255g (9 oz.) without batteries

Measuring head: 651g ( $22\frac{15}{16}$  oz.)

**Standard accessories:** Standard white calibration plate CR-A43, 9V battery, AC adapter AC-A10, case CR-A60b

**Optional accessories:** Data processor for CR-200 series Chroma Meters, Data Processor DP-100, Color Calibration Plate Set CR-A47 (red, orange, yellow, yellow-green, green, cyan, purple, deep pink, and brown), Pivoting Base CR-A12, Light-Projection Tube CR-A33a, Granuler-Materials Attachment CR-A50.

Specifications subject to change without notice