Colo Science
Laboratory & Scientific Equipment

COLO.SCIENCE · TECHNICAL SPECIFICATION

TWELVE ANGLES, TWO RECEIVERS · FULL CHARACTERISATION OF SPECIAL-EFFECT FINISHES

CM3012

Multi-Angle Spectrophotometer · 12 measuring angles · 2 receivers (45° and 15°) · 400–700 nm · camera preview · 3.5" touch screen

CM3012 Multi-Angle Spectrophotometer measures the colour of metallic, pearlescent and other special-effect finishes at 12 angles in one measurement. The colour of an effect coating changes with the viewing angle, so a single-angle instrument cannot tell whether a body panel, bumper or trim part matches its standard — the multi-angle instrument shows the difference at near-specular, face and flop angles. Two receivers and sparkle, coarseness and colour-variation values characterise the effect pigment itself.

- 12 angles
- 2 receivers (45° and 15°)
- LED with blue enhancement
- Concave grating + CMOS array
- 400–700 nm / 10 nm
- 0–600 % reflectance
- ΔE*ab 0.02 repeatability
- Camera preview
- SG · DC · CV effect values
- USB + Bluetooth 5.0

Document type: **Technical Specification Sheet**
Product: **CM3012 Multi-Angle Spectrophotometer**
Format: Print layout · A4 landscape

CM3012 product page | Spectroscopy & Color — overview | Spectroscopy & Color catalogue

Request quote

ANGLES	RANGE
12 · 2 receivers	400–700 nm · 0–600 %
REPEATABILITY	**INTER-INSTRUMENT**
ΔE*ab 0.02	0.18 ΔE*00



CM3012 · handheld multi-angle spectrophotometer with 3.5" touch screen

MODEL
CM3012

ADDRESS / HQ
Polje ob Sotli 4
SI-3255, Slovenia

CONTACT
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CM3012 · product overview

Multi-angle colour measurement for metallic, pearlescent and special-effect finishes — on the car body, on the line and in the laboratory

CORE TECHNOLOGY

12 measuring angles, 2 receivers (45° and 15°) — 45° receiver: 45as−15°, 45as15°, 45as25°, 45as45°, 45as75°, 45as110°; 15° receiver: 15as−45°, 15as−30°, 15as−15°, 15as15°, 15as45°, 15as80°.

Concave grating and a 256-pixel dual-array CMOS image sensor — reflectance 400–700 nm with 10 nm interval, 0–600 % for bright metallic finishes.

Full-spectrum LED with blue enhancement — no spectral gap of a white LED in the blue region; light source life 5 years or 3 million measurements.

Colour camera preview — the measured area is shown on the screen, also on curved and small parts.

Repeatability ΔE*ab 0.02, inter-instrument agreement 0.18 ΔE*00 — data that can be compared between instruments and sites.

Effect values SG, DC and CV — sparkle grade, diffuse coarseness and colour variation with their differences to the standard.

Approx. 1 s per angle, approx. 12 s for all angles — single, average or continuous measurement, triggered by button or software.

Battery powered, 1 kg — 6 000 measurements on a charge, 1 000 standards and 4 000 samples stored, USB and Bluetooth 5.0.

PRODUCT HIGHLIGHTS



12 angles in one measurement
All angles are measured at once and shown in one table on the touch screen.



Flat and curved samples
Wide measuring port for panels, test cards and curved body parts.



Camera preview
The built-in colour camera shows the measured area before the measurement.



Touch-screen operation
Colour space, illuminant, tolerances and records set directly on the instrument.

APPLICATIONS



Automotive paint



Body repair & refinish



Effect pigments & coatings



Coated plastics & electronics



Interior trim parts



R&D and incoming inspection

OBSERVERS	ILLUMINANTS	ALL ANGLES	BATTERY
2° and 10°	18	≈ 12 s	6 000 measurements

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CM3012 · technical parameters

12 angles · 2 receivers (45° and 15°) · 400–700 nm / 10 nm · 0–600 % · 2°/10° observer

TECHNICAL PARAMETERS

Measuring geometry	12 measuring angles, 2 receivers (45° and 15°)
Measuring angles	45° receiver: 45as−15°, 45as15°, 45as25°, 45as45°, 45as75°, 45as110° 15° receiver: 15as−45°, 15as−30°, 15as−15°, 15as15°, 15as45°, 15as80°
Standards	ASTM D2244, E308, E1164, E2194, E2539; DIN 5033, 5036, 6174, 6175-1, 6175-2; ISO 7724, ISO 11664-4; SAE J1545
Light source	Full-spectrum LED with blue enhancement; life 5 years, 3 million measurements
Spectral separation	Concave grating
Sensor	256-pixel dual-array CMOS image sensor
Wavelength range	400–700 nm, 10 nm interval, 10 nm half bandwidth
Reflectance range	0–600 %
Measuring aperture	Illumination Ø23 mm / measuring spot 9 × 12 mm (Ø10 mm / 6 × 8 mm on request)
Colour spaces	CIE Lab, XYZ, Yxy, LCh, βxy, DIN Lab99
Colour difference	ΔE*ab, ΔE*94, ΔE*cmc (2:1), ΔE*cmc (1:1), ΔE*00, DIN ΔE99, ΔE DIN 6175
Other indices	Flop index, Int-Em
Observer	2° and 10°
Illuminants	D65, A, C, D50, D55, D75, F1, F2 (CWF), F3, F4, F5, F6, F7 (DLF), F8, F9, F10 (TPL5), F11 (TL84), F12 (TL83/U30)
Displayed data	Spectral curve and values, chromaticity values, colour difference values and graph, pass/fail, colour offset, colour simulation, sample effect values and effect differences

Measuring time	Approx. 1 s per angle; approx. 12 s for all angles
Repeatability	Spectral reflectance: standard deviation within 0.08 %; chromaticity ΔE*ab 0.02 (white calibration tile, 30 measurements at 5 s intervals after calibration)
Reproducibility	ΔE* < 0.10 (average, grey BCRA tile); ΔE* < 0.25 (average, colour BCRA tiles)
Inter-instrument agreement	0.18 ΔE*00 (average, BCRA Series II tiles)
Effect parameters	Sparkle grade (SG), diffuse coarseness (DC), colour variation (CV)
Effect repeatability	SG 0.12 %, DC 0.09 % (standard deviation of 10 measurements at 10 s intervals)
Effect reproducibility	SG 1.9 %, DC 1.4 % (BCRA Series II tiles)
Measurement mode	Single, average (1–99) or continuous (1–99); triggered by button or software
Positioning	Colour camera preview of the measured area
Data storage	1 000 standards, 4 000 samples
Display	3.5" TFT colour LCD, capacitive touch screen
Interface	USB, Bluetooth 5.0
Calibration	White calibration board (data stored in the instrument), black light trap; interval 4 h, 8 h, 24 h or at start-up
Power supply	Li-ion battery 3.7 V, 5 000 mAh; 6 000 measurements within 8 h on a full charge
Dimensions, weight	195 × 83 × 128 mm, approx. 1 kg
Instrument languages	English, Chinese
Environment	Operation 10–50 °C, storage −20–50 °C; ≤ 85 % RH, non-condensing

CM3012 · delivery, options and series

Standard delivery, options and comparison of the multi-angle series

DELIVERY AND SERIES

Standard delivery

Instrument	CM3012 multi-angle spectrophotometer with 3.5" touch screen and built-in battery
Calibration	White calibration board, black light trap
Power and data	Power adapter, USB cable; PC software available for download
Carrying case	Hard case for transport and storage of the instrument and accessories
Other	Protective cap, wrist strap, user guide

Options

Printer	Micro-printer (optional)
Aperture	Illumination Ø10 mm / spot 6 × 8 mm for small parts (on request)

Multi-angle series — which model?

Model	CM3003	CM3005	CM3006	CM3008	CM3012
Measuring angles	3	5	6	8	**12**
Receivers	45°	45°	45°	45° + 15°	**45° + 15°**
Effect values SG · DC · CV	—	—	✓	✓	✓
Repeatability ΔE*ab	0.04	0.03	0.03	0.03	**0.02**
All angles	≈ 3 s	≈ 5 s	≈ 6 s	≈ 8 s	**≈ 12 s**

All models: same handheld body, concave grating with 256-pixel CMOS array, 400–700 nm, 0–600 %, camera preview, 3.5" touch screen, battery operation. 3 or 5 angles for colour and flop of metallic finishes; 6 angles add sparkle, coarseness and colour variation; 8 and 12 angles add a second 15° receiver for pearlescent, interference and other special-effect pigments.



CM3012 · instrument, calibration accessories and carrying case

Typical samples

Automotive coatings: metallic and pearlescent body colours, bumpers and add-on parts matched to the body.

Refinish: checking the repair colour against the original paint at every angle.

Effect pigments and paints: aluminium, mica and interference pigments in development and incoming inspection.

Coated plastics and consumer goods: housings, trims and packaging with metallic or pearlescent finish.

CM3012 · configuration and support

Ordering information, configuration checklist and contact

MEASUREMENT WORKFLOW, CONFIGURATION AND SUPPORT



CM3012 · measurement on the car body

Ordering information

Model	CM3012 Multi-Angle Spectrophotometer
Angles	12 measuring angles, 2 receivers (45° and 15°)
Aperture	Illumination Ø23 mm / measuring spot 9 × 12 mm (Ø10 mm / 6 × 8 mm on request)
Options	Micro-printer

Configuration checklist

Finish: solid, metallic, pearlescent or special-effect; size and curvature of the parts.

Method: angles and tolerances required by your customer or standard (ASTM E2194, E2539, DIN 6175, SAE J1545).

Colour data: colour space, ΔE formula, illuminant and observer you report; data transfer to PC or quality system.

SUPPLIER AND SUPPORT

COLO Lab Experts
Polje ob Sotli 4, SI-3255, Slovenia

Selection guidance: send the type of finish and the angles your customer specifies — we confirm the model, aperture and delivery time with the quotation.

QUICK CONTACT

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COLO.SCIENCE · COLOUR MEASUREMENT SUPPORT

Matching metallic or pearlescent colours?

Send the finish, the parts and the angles you need to report — we propose the model and confirm it with the quotation.

Request quotation | sales@colo.si | +386 70 713 437

Specifications are subject to change without notice. Values refer to standard laboratory conditions.