

BYK-mac

Total color impression of effect finishes

The appearance of effect finishes is influenced by different viewing angles and viewing conditions. Apart from a light-dark flop and color shift special sparkling effects can be created. The BYK-mac spectrophotometer is unique as it measures both multi-angle color and flake characterization in one portable device.

- Traditional 5-angle color measurement:
15° / 25° / 45° / 75° / 110°
- Additional color measurement behind the gloss for color travel of interference pigments: -15°
- Sparkle and graininess measurement for flake characterization

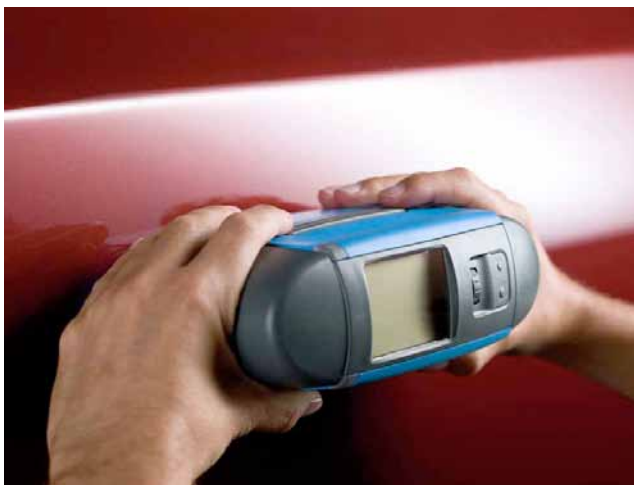
Ergonomic design and easy operation

The shape of the instrument is designed to ensure easy handling and true portability. Due to its intuitive menu quality control of metallic finishes has never been easier.

- Menu guided operation according to your own sampling procedure
- Designated buttons for standard and sample readings
- Scroll wheel to select menu functions
- Large display: complete statistics for selectable values and alphanumerical name input
- Storage of up to 1000 readings in selectable memories
- auto-chart software for professional analysis, documentation and data management



D65/10°	Center Hood	1/3
-15°	ΔE*	ΔS
15°	1.24	ΔG
25°	1.28	3.2
45°	0.94	
75°	1.37	1.5
110°	1.61	
diff	1.10	4.7
Royal Blue		



Reliable readings at any time

In order to guarantee stable positioning, the BYK-mac is equipped with trigger pins on the bottom plate of the instrument. If the pins do not have contact with the surface, an error message will be displayed. This ensures reproducible results on test panels as well as curved parts ($r > 500 \text{ mm}$).

Additionally, the surface temperature is measured and saved with each measurement.

Accurate results and low maintenance

The BYK-mac spectrophotometer uses a light source with long-term stability and patented illumination control which provides superior accuracy and low maintenance for many years.

- Stable, long-term calibration – needed only every three months
- Temperature independent measurement results between 10 - 40 °C – without calibration
- Excellent agreement between instruments
- 10 year warranty on the light source – no lamp changes needed



Always ready

The instrument is operated with a rechargeable battery pack (Li-Ion). The docking station automatically charges the battery pack in the instrument as well as a spare pack located in the docking station.

Optionally the instrument can be operated with 4 standard mignon alkaline or rechargeable batteries.

The docking station also transfers measured data to a PC.



Info!

For more information on visual evaluation of effect finishes see *byko-spectra effect*, page 127.

BYK-mac with small aperture

Measurement of effect finishes on small or curved parts

Special effect finishes are used in many applications to create new color impressions emphasizing the design of a product. Objects like mobile phone housings, bicycles or window handles are very small or curved. They require a color instrument with small aperture and repeatable sample placement. The BYK-mac with 12 mm aperture guarantees repeatable results even on such products.

Total color impression of effect finishes

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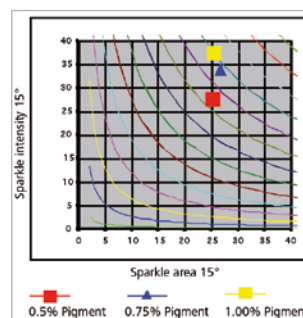
New!



Reliable readings at any time

Menu guided operation with designated buttons for standard and sample readings

- Scroll wheel to select menu functions
- Storage of up to 1000 readings in selectable memories
- Stable, long-term calibration – needed only every three months
- Temperature independent measurement results between 10 – 40°C – without calibration
- 10 year warranty on light source – no lamp changes needed
- Operated by a rechargeable battery pack – good for 1000 readings
- auto-chart software for professional analysis, documentation and data management



BYK-mac data for effect pigments with different concentration levels.

Save!

Special Introductory Offer

– valid only for a limited time

CM-6362 BYK-mac

CM-6397 BYK-mac

CM-6363 BYK-mac Sensor

CM-6398 BYK-mac Sensor

In compliance with:

Standards

ASTM	D 2244, E 308, E 1164, E 2194
DIN	5033, 5036, 6174, 6175-2
ISO	7724
SAE	J 1545

Ordering Information

Cat. No.	Description
CM-6362	BYK-mac*
CM-6397	BYK-mac*
CM-6363	BYK-mac Sensor
CM-6398	BYK-mac Sensor
SE-6340	Extended Warranty one year additional

Comes complete with:

Multi-angle spectrophotometer
 Black calibration standard
 White calibration standard with certificate
 Cyan and effect checking reference
 Protective cap
 Cleaning set for bottom plate
 2 light protection covers
 Seal replacement kit
 *BYKWARE auto-chart software
 Docking station with USB cable for memory transfer
 Instrument interface cable for online data transfer
 2 rechargeable Li-ion battery packs
 Battery holder; 4 x AA batteries
 Short instructions; Operating manual on CD
 Carrying case; Training

Free 1x preventive maintenance service during warranty period

Hardware Requirements:

Operating system: Windows® 2000 or higher
 Excel® version: 2002 or higher VBA
 Memory: min. 256 MB RAM (recommended 512 MB)
 Hard disk capacity: min. 100 MB
 Monitor resolution: XGA (1024 x 768) or higher
 Disk drive: CD-ROM or DVD
 Interface: USB-port



Technical Specifications

Measuring Area
23 mm diameter
12 mm diameter
23 mm diameter
12 mm diameter

Color

Measuring	45° illumination -15°, 15°, 25°, 45°, 75°, 110°
Geometry	aspecular viewing
Spectral Range	400 – 700 nm, 10 nm resolution
Measurement Range	0 to 400 % reflectance
Repeatability¹	0.02 ΔE^* (10 consecutive measurements on white)
Reproducibility¹	0.20 ΔE^* (average on 12 BCRA II tiles)
Color Scales	ΔE^* ; ΔE CMC; ΔE 94; ΔE 2000; ΔE 99; ΔE DIN6175
Illuminants	A; C; D50; D65; F2; F7; F11; F12
Observer	2°; 10°

Effect

Measurement	15° / 45° / 75° and diffused illumination
Geometry	perpendicular viewing
Effect Parameters	ΔS ; ΔS_a ; ΔS_i ; ΔG
Repeatability¹	S_a / S_i : 5% or > 0.50 / $G = \pm 0.05$
Reproducibility¹	S_a / S_i : 10% or > 1.00 / $G = \pm 0.15$

Measuring Time	< 6 seconds
Memory	1000 standards / samples
Language	English, German, French, Italian, Spanish
Power Supply	Rechargeable battery pack or 4 mignon AA batteries (alkaline or rechargeable)
Operating Temperature	10 to 42° C (50 to 110 ° F)
Relative Humidity	up to 85%, 35° C (95° F); non-condensing
Dimensions	21.8 x 8.1 x 14.7 cm (8.6 x 3.2 x 5.8 in.)
Weight	approx. 1.3 kg (approx. 2.86 lbs)

¹ Standard deviation

BYK-mac Training

BYK-Gardner offers you more than just an instrument. We assist you in analyzing your color readings as well as sparkle and graininess data. As a result you will be able to use the BYK-mac to save time and money, while at the same time improving quality. Therefore, the instrument comes with a one day training course including:

1. Color and Effect Theory

- Parameters influencing total color impression of effect finishes
- Color and effect differences for trouble shooting

2. Operation and Software training

- Standard management
- Set-up an "organizer" to create a routine measurement procedure
- Programming of the instrument with "organizer" and measurement of several samples
- Data transfer to auto-chart software and saving in a database for routine QC
- Data analysis using standard reports:
 - Lab-scatter graph per angle to show at one glance whether all parts are within specifications
 - Color travel by sample to show how individual measurement zones perform per measurement angle
 - Effect graph to control whether sparkle and graininess values are within specification

- Create your own reports in Excel®
 - Transfer data from the database to Excel®
 - Pivot function to define layout in Excel®

The training can be performed in one day or two half days. It is recommended to split the training into two half days:

Day 1: Theory and basic operation (set-up organizer, taking readings and saving in a database)

Day 2: 3-4 weeks later to ensure readings were taken and saved in a database. Data analysis and standard QC report can be explained using custom specific data.

Certified For Preventive Maintenance see page 271.

Ordering Information

Cat. No.	Description
CM-6332	Black Calibration Standard
CM-6336	Protective Cap, BYK-mac 23 mm measuring area
CM-6399	Protectice Cap, BYK-mac 12 mm measuring area
CM-6360	Docking Station
CM-6337	USB Interface Cable
CM-6413	Instrument Interface Cable, online
CM-6359	Battery Pack
CM-6364	Cleaning Set for Bottom Plate
CM-6348	Seal Replacement Set
CM-6414	Light Protection Cover
AW-4809	BYKWARE auto-chart

Accessories

To perform zero calibration
Snap on cover to protect optics and interior components
Snap on cover to protect optics and interior components
Incl. USB interface cable and charger 100 – 240 V self adapting (For BYK-mac with catalog number 6340 and 6345, please contact customer service for an upgrade package)
To connect the docking station to the PC, USB-A plug, 3 m length
To connect the instrument directly to the PC
Rechargeable battery pack for automatic charge in docking station
To clean instrument aperture and pin covers from dust and grease Including 3 light protection rubber seals and 8 rubber pin covers
To measure very bright colors; 10 pieces included
Software for data analysis with database management and professional documentation in Excel®

Note: For replacement of white, cyan or effect standard, please contact your local service department.