

BYK-mac i

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 i 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 color display - easy-to-read inside and outside
- Storage of up to 1000 readings in selectable memories
- smart-chart software for professional analysis, documentation and data management



Hood	D65/10°		3/3	
-15°	ΔL^*	Δa^*	Δb^*	ΔE_{pD}
15°	0.05	0.11	-0.03	0.12
25°	0.05	0.08	-0.06	0.11
45°	-0.14	0.05	-0.11	0.19
75°	-0.22	0.02	0.13	0.26
110°	-0.13	0.15	0.32	0.38
			0.34	0.40
			ΔEt	0.27

Hood	D65/10°		2/2
ΔSE	ΔEt	ΔSt	
0.23	0.11	0.21	
pass			

Reliable readings at any time

In order to guarantee stable positioning, the BYK-mac i 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 ($r > 500$ mm).

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

Accurate results and low maintenance

The BYK-mac i 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 allowing usage of digital standards among the supply chain
- 10 year warranty on the light source – no lamp changes needed

Quantification of Fluorescent Light

The BYK-mac i spectrophotometer is equipped with additional sensors to detect fluorescent light excited in the visible range. The Intensity Emission value quantifies the fluorescent light and can be used as a preliminary indicator for light fastness.

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.



Plug-in WiFi Adapter

New!

Do you want to be as flexible as possible when transferring data? The new plug-in WiFi adapter is an optional accessory that can be easily attached to the interface port of the BYK-mac i. Setting-up your own network within a blink of an eye guarantees flawless data transfer which is not tied down by a cable anymore.



Ordering Information

Cat. No.	Description
7052	WiFi Adapter BYK-mac i

Technical Specifications

Plug-in adapter to set-up wireless data transfer to a PC

In compliance with:

Standards

ASTM	D 2244, E 308, E 1164, E 2194
DIN	5033, 5036, 6174, 6175-2
DIN EN ISO	11664
SAE	J 1545



Ordering Information

Cat. No.	Description
7030	BYK-mac i 23 mm
7034	BYK-mac i 12 mm
7031	BYK-mac i Sensor 23 mm
7035	BYK-mac i Sensor 12 mm

Comes complete with:

Multi-angle spectrophotometer
Black calibration standard
White calibration standard with certificate
Color and effect checking reference
Protective cap
Cleaning set for bottom plate
2 light protection covers
Seal replacement kit
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
Software for download (7030 and 7034 only):
smart-lab Color or smart-process with 2 licenses

Note: After software download both software packages can be used for 30 days free trial.

Thereafter, the user needs to decide and register for one software package

System Requirements:

Operating system: Windows 7 SP1, 8.1 or 10
Microsoft® .NET Framework 4.5.2
Hardware: Core 2 Duo, 2.2 GHz; i7, 2.5 GHz recommended, or equivalent
Memory: 4 GB RAM, 8 GB recommended
Hard-disk capacity: 2 GB during installation
Monitor resolution: 1280 x 1024 pixel or higher
Interface: free USB-port

Technical Specifications

Measuring Area	
23 mm diameter	
12 mm diameter	
23 mm diameter	
12 mm diameter	
Color	
Measuring Geometry	45° illumination -15°, 15°, 25°, 45°, 75°, 110° aspectual viewing
Spectral Range	400 - 700 nm, 10 nm resolution
Measurement Range	0 to 600 % reflectance
Repeatability	0.01 ΔE^* (10 consecutive measurements on white)
Reproducibility	Grey BCRA tiles: avg. $\Delta E^* < 0.10$ Chromatic BCRA tiles: avg. $\Delta E^* < 0.25$
Color Scales	ΔE^* ; ΔE CMC; ΔE 94; ΔE 2000; ΔE 99; ΔE DIN6175
Index	Flop, Int-Em
Illuminants	A; C; D50; D65; F2; F7; F11; F12
Observer	2°; 10°
Effect	
Measurement Geometry	15° / 45° / 75° and diffused illumination perpendicular viewing
Effect Parameters	ΔS ; ΔS_a ; ΔS_i ; ΔG
Repeatability	S_a / S_i : 5% or $> 0.50 / G = \pm 0.05$
Reproducibility	S_a / S_i : 10% or $> 1.00 / G = \pm 0.15$
Measuring Time	< 6 seconds
Memory	1000 standards / samples
Display	2.7 in. TFT color LCD display
Language	English, French, German, Italian, Japanese, 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)

BYK-mac i 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 i 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 smart-process

- 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 smart-chart software and saving in a database for routine QC
- Data analysis using standard reports:
 - Test Report:
Shows measurement data for a single test series - ideal for color harmony reviews
 - Scorecard (Management Summary Report):
Quick overview how production is running over the selected time range
 - Trend Report:
Typical process control chart showing the data over time or by individual.
- Create your own reports reports in Excel®:
 - Transfer data from the database to Excel®

2. Operation and Software training smart-lab

- Standard management
- Measure standards and samples by single and average readings
- Save, recall and delete measurements
- Change illuminants, observers, color equations
- Data analysis using standard reports:
 - Scatter graph per angle to show at one glance whether all parts are within specification
 - Color & Effect Travel to show how individual samples perform per measurement angle
 - Effect graph to control whether sparkle and graininess values are within specification
 - Spectral curves for detailed analysis
- Create your own reports in Excel®:
 - Transfer data from the database to 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.

Ordering Information

Cat. No.	Description
7044	Black Standard, BYK-mac i
6336	Protective Cap, BYK-mac 23 mm
6399	Protectice Cap, BYK-mac 12 mm
6360	Docking Station, BYK-mac
6337	USB Interface Cable
6413	Online Cable, BYK-mac
7052	WiFi Adapter BYK-mac i
6359	Battery Pack, BYK-mac
6364	Cleaning Set, BYK-mac
6414	Light Protection Cover, BYK-mac
6348	Seal Set, BYK-mac
4862	Software smart-lab Color, BYK-mac i
4831	Software smart-process

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
Plug-in connector to set-up wireless data transfer to a PC
Rechargeable battery pack for automatic charge in docking station
To clean instrument aperture and pin covers from dust and grease
To measure very bright colors; 10 pieces included
Including 3 light protection rubber seals and 8 rubber pin covers
Lab QC software for online color & effect control with BYK-mac i
Process QC software for BYK-mac i, cloud-runner and wave-scan

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