

# BYK-mac i ROBOTIC

## Automatic measurement of total color impression of effect finishes at the line

Products can only be manufactured with uniform and consistent quality when process stability is guaranteed. Therefore, multi-angle color, sparkle and graininess must be measured on a routine basis. The BYK-mac i ROBOTIC spectrophotometer allows automated total color control as it is mounted on a robotic arm. The robotic system not only measures a high number of cars, but also on the same areas.

## Total color impression of effect finishes

The BYK-mac i ROBOTIC measures both multi-angle color and flake characterization.

- Multi-angle color measurement at 6-angles clearly defines the light-dark as well as color flop behavior of effect finishes
- Sparkling and Graininess control with a high resolution CCD camera simulates effect changes under direct and diffuse lighting conditions.
- Multi-angle color and effect data help to analyze the cause of a color mismatch



## Reliable and objective color and effect data

The BYK-mac i ROBOTIC spectrophotometer uses a light source with long-term stability and patented illumination control which provide 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
- 10 year warranty on light source – no lamp changes needed
- Excellent agreement between instruments and correlation to BYK-mac i and BYK-mac i COLOR



## Reliable readings at any time

In order to guarantee stable positioning, the BYK-mac i ROBOTIC is equipped with trigger pins on the bottom plate of the instrument. The sensitivity of the pins can be adjusted to the curvature of the measurement area. If the pins do not have contact with the surface an error message will be displayed.

## Quantification of Fluorescent Light

The BYK-mac i ROBOTIC 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.

In compliance with:

### Standards

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



### Ordering Information

Cat. No.	Description
<b>7036</b>	BYK-mac i ROBOTIC

#### Comes complete with:

Multi-angle spectrophotometer  
 White calibration standard with certificate  
 Color and effect checking reference  
 Light protection cover  
 Software smart-chart  
 Communication software  
 Installation kit  
 Operating manual on CD  
 Carrying case; Training

#### Hardware 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  
 Disk drive: CD-ROM or DVD drive

### Technical Specifications

<b>Color</b>	
<b>Measuring Geometry</b>	45° illumination -15°, 15°, 25°, 45°, 75°, 110° specular viewing
<b>Measuring Area</b>	87 x 23 mm (3.4 x 0.9 in.)
<b>Spectral Range</b>	400 - 700 nm, 10 nm resolution
<b>Measurement Range</b>	0 to 600 % reflectance
<b>Repeatability</b>	0.01 $\Delta E^*$ (10 consecutive measurements on white)
<b>Reproducibility</b>	Grey BCRA tiles: avg. $\Delta E^* < 0.10$ Chromatic BCRA tiles: avg. $\Delta E^* < 0.25$
<b>Color Scales</b>	$\Delta E^*$ ; $\Delta E$ CMC; $\Delta E$ 94; $\Delta E$ 2000; $\Delta E$ 99; $\Delta E$ DIN6175
<b>Index</b>	Flop, Int-Em
<b>Illuminants</b>	A; C; D50; D65; F2; F7; F11; F12
<b>Observer</b>	2°; 10°
<b>Effect</b>	
<b>Measurement Geometry</b>	15° / 45° / 75° and diffused illumination perpendicular viewing
<b>Effect Parameters</b>	$\Delta S$ ; $\Delta S_a$ ; $\Delta S_i$ ; $\Delta G$
<b>Repeatability</b>	$S_a / S_i$ : 5% or $> 0.50 / G = \pm 0.05$
<b>Reproducibility</b>	$S_a / S_i$ : 10% or $> 1.00 / G = \pm 0.15$
<b>Object Curvature</b>	Radius $> 400$ mm
<b>Measuring Time</b>	$< 6$ seconds
<b>Memory</b>	1000 standards / samples
<b>Power Supply</b>	External power supply 24 VDC
<b>Interface</b>	RS 422
<b>Robotic Requirements</b>	Vibration-free operation
<b>Operating Temperature</b>	10 to 42° C (50 to 110 ° F)
<b>Relative Humidity</b>	up to 85%, 35° C (95° F); non-condensing
<b>Dimensions</b>	21 x 12.5 x 17.5 cm (8.3 x 5 x 6.9 in.)
<b>Weight</b>	approx.3.5 kg (approx.7.7 lbs)
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## BYK-mac i ROBOTIC Training

BYK-Gardner offers you more than just an instrument. We assist you in operating the whole system and analyzing your color, sparkle and graininess data. Therefore, the instrument comes with a two day training course including:

### Color and Effect Theory

- Visual perception and instrumental measurement of multi-angle color, sparkle and graininess.
- Data interpretation for trouble shooting
- Support in integrating the BYK-mac i ROBOTIC sensor into an automated measurement system

### Software training

- 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.

Day 1: Color and Effect theory with data interpretation for optimization and trouble shooting  
Support in integrating the BYK-mac i ROBOTIC sensor into an automated measurement system  
Day 2: Software training with data analysis using standard reports

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## Ordering Information

Cat. No.	Description
6417	Light Protection Cover for 7036
4831	Software smart-process

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## Accessories

To avoid the influence of ambient light
Process QC software for BYK-mac i ROBOTIC and wave-scan ROBOTIC

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