micro-gloss

Intelligent gloss measurement with smart communication

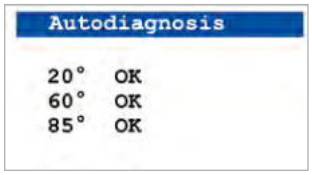
The micro-gloss has been the unsurpassed industry standard in gloss measurement for many years. It is the only glossmeter combining the highest accuracy, ease-of-use and multiple functionality – essential for today's testing requirements. In addition, the smart-chart software is the ideal tool for smart communication with professional documentation and efficient data analysis.

Brilliant color display: easy to read – easy to use

Ergonomics and easy handling were the main focus for the design. The micro-gloss is not too large and not too small – it feels just right in your hand. The scroll wheel operation and new color display with an easy-to-navigate menu make gloss measurement easier than ever before.

Auto diagnosis: Standard OK - Calibration OK

Accurate readings require reliable calibration. The gloss meter and calibration holder make a perfect couple – the calibration standard is always protected in the holder of the micro-gloss.
The intelligent auto diagnosis of the gloss meter is a unique feature which guarantees long-term calibration stability and tells you when to calibrate. It even checks whether the standard is clean. Operator friendly. Safe.



Gloss of paint or metal - from matte to mirror gloss

With the micro-gloss gloss meter you can measure any material - paints, plastics or brightened metals. Its expanded range measures from very matte to mirror like reflection of up to 2000 gloss units, automatically and without additional calibration. Always reliable results – according to international standards.

Smart functions for any task

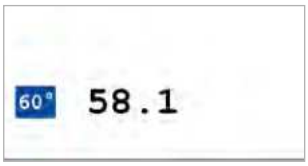
Different tasks require different tools. The easy to turn-scroll wheel of the glossmeter quickly shows you all needed functions – even without a PC:

The **Basic mode** is your tool to quickly check the gloss of a few samples.

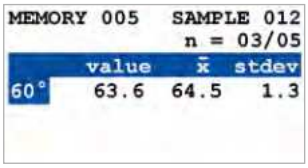
The **Statistic mode** not only shows the average, but all statistical data needed to judge whether the measured difference is significant or how uniform the surface gloss is on your sample. You define what you want to see: mean, standard deviation, range, min/max, ...

The **Difference mode** allows you to define a reference with Pass/Fail limits and will compare all of the following measurements to the selected reference. The Pass/Fail indication is colorfully shown on the high resolution display – ideal for production control.

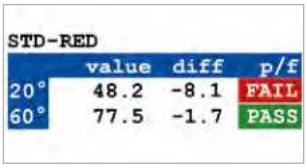
The **Continuous mode** is the most efficient way to quickly check the uniformity of a large sample surface. You define the measurement interval and are now ready to continuously measure the gloss by sliding the micro-gloss over the surface. When finished, the average with min – max range are displayed.



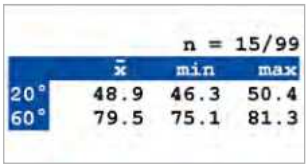
Basic mode



Statistic mode



Difference mode



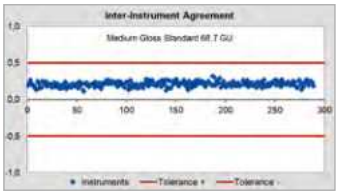
Continuous mode

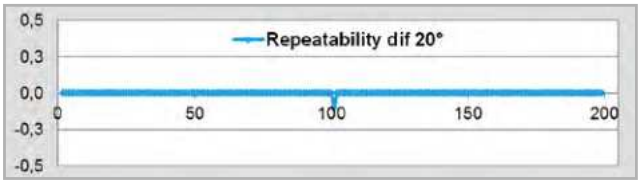
Technical Performance: Unsurpassed in the industry

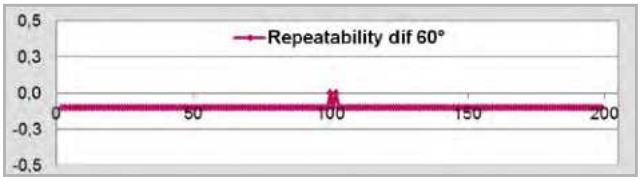
No matter how harsh your production are or how thight your limits may be, accuracy and reliability of the micro-gloss are proven by thousand of users to guarantee always the highest quality.

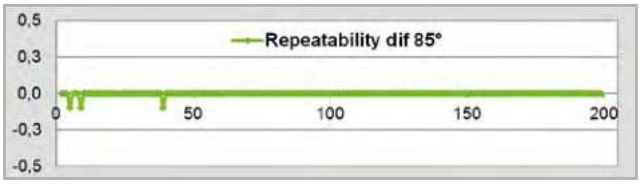
The long-term stable LED light source of the glossmeter provides not only highly repeatable results for many years, but also will never burn out. A 10 year warranty on the lamp life is guaranteed. Due to advanced temperature control, the micro-gloss assures the highest stability of the gloss radings – if you are in the lab or move to a "hot spot" on the line.

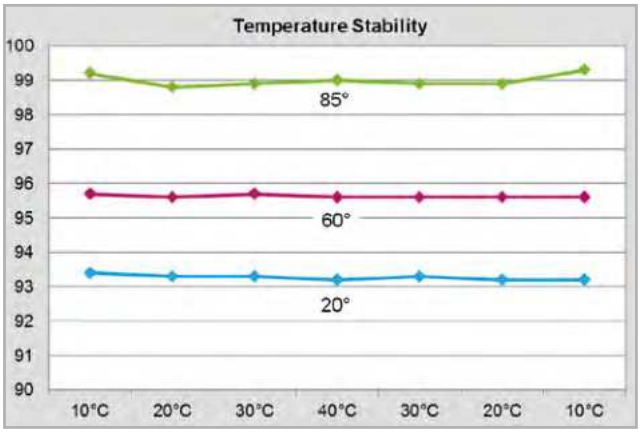
Our patented calibration procedure during the production of the glossmeters enables an excellent inter-instrument agreement. No matter how far your customer may be away, if he is one of the thousands of micro-gloss users, he will read the same values as you.







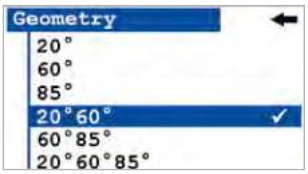




micro-TRI-gloss

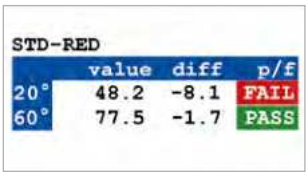
See changes under the right angle

High – medium – low gloss: What is your application?
The micro-TRI-gloss combines 20°, 60°, 85° in one glossmeter – as handy as the one angle unit. Having three geometries in one unit allows you to be in compliance with international standards and to quickly recognize quality variations.

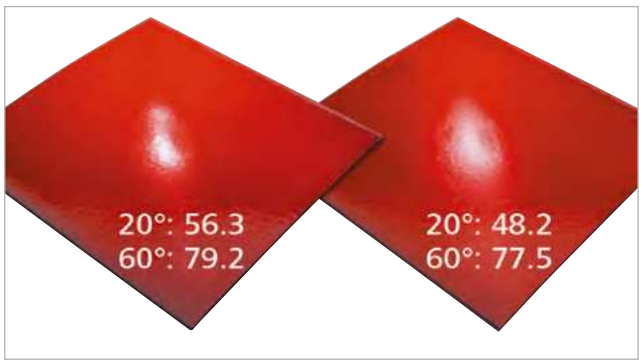


All selected angles measure at the same location and the results are displayed instantly – including Statistics, Difference, or Pass/Fail.

The different gloss of these two samples is more clearly shown in the 20° readings.



In order to obtain differences clearly, over the whole range from matte to high gloss, three measurement geometries were specified in international glossmeter standards. Each geometry is optimized for a specific gloss range.



micro-TRI-gloss *μ*

Gloss and Film Thickness in one Instrument

An efficient coatings process should use as little paint as possible and fulfill the quality specifications given by the customer. Gloss and film thickness are important QC criteria for coatings.
The micro-TRI-gloss M measures both, at the same position and in seconds. This saves time and is ideal for checks in the field – only one instrument to carry.

- Simultaneous display 20°, 60°, 85° – for high gloss to matte coatings
- Dual sensor Fe/NFe – measures thickness on stell as well as on aluminum

Standards

	Gloss	Thickness
ISO	2813, 7668	2178, 2360, 2808
ASTM	D523	B499, D1400
DIN	675301	

micro-gloss S-Family

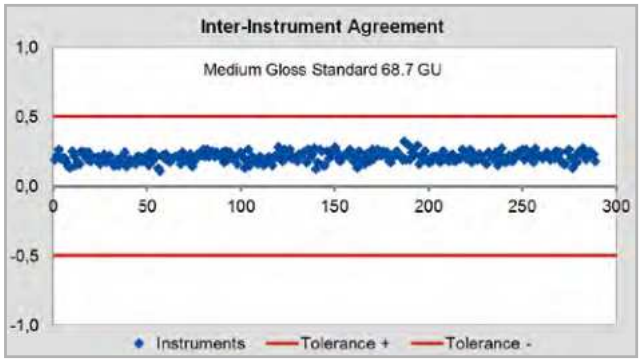
A matte finish is not only a new design trend but also can be a must for applications where nor or low reflection is essential – such as car interior. Often, a variety of materials, from leather to plastics, is used and needs to be harmonized. Additionally, surface structures vary from large grains to fine stipples, usually with very low gloss. In order to guarantee a uniform look among the various parts, very thight tolerances are specified.

Only testing instruments with excellent precision will be able to objectively control production. The new micro-gloss S family offers improved perfomance for 60° gloss in the critical low gloss range (0–20 GU). This excellent accuracy can be guaranteed due to our patented calibration procedure during the production of the glossmeters.

Technical Specifications

Measurement range	0 - 20 GU	20 - 100 GU	100 - 2000 GU
Repeatability	± 0.1 GU	± 0.2 GU	± 0.2 %
Reproducibility	± 0.2 GU	± 0.5 GU	± 0.5 %

Info! Please note additonal information of this applications on page 54.



Excellent inter-instrument agreement

micro-gloss XS

Small port for small parts

Today, many products not only consist of different parts, but are composed of parts with similar surface appearance. An appealing design is important for the success of products like smart phones, computers or home electronics. Often small parts are integrated in a large part or connect parts such as frames, buttons or decorative trim pieces. Their size and design make it difficult to evaluate with a classical gloss meter.

The micro-gloss XS is a 60° gloss meter with a small measuring area of 2×4 mm, an ideal solution to measure small parts and assure that they fit with the large components.

An additonal version, micro-gloss 60° XS-S, is available for measuring very matte surfaces with increased technical performance.

micro-gloss 60° robotic

Automatic online gloss control

A stable running process is the key for uniform and consistent quality. Therefore, gloss needs to be measured on a routine basis in the production process and the measurement results need to be documented for clear communication.

The new micro-gloss robotic allows automatic appearance control. With the robust fixture it can be integrated into measuring systems like a xy-table. Thus, measurements are taken always on the same sample area, which ensures repeatable positioning and reliable results.

Stable process means consistent quality

Automated gloss control allows measuring a high number of parts and provides complete and representative data for statistical process control - 100 % checking becomes reality.

The calibration tile is supplied in a special track which enables fast and automatic calibration on a regular basis - accuracy at any time.

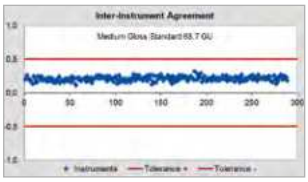
micro-gloss 60° S robotic

A matte finish is not only a new design trend, but also can be a challenge for product harmony. In order to guarantee a uniform look among the various components of a product, very tight tolerances are specified.

Only test equipment with excellent precision will be able to objectively control production. The new micro-gloss 60° S robotic offers improved performance for 60° gloss in the critical low gloss range (0-20 GU). This excellent accuracy can be guaranteed due to our patented calibration procedure during the production of the gloss meters.

Technical Specifications

Measurement range	0 - 20 GU	20 - 100 GU	100 - 2000 GU
Repeatability	± 0.1 GU	± 0.2 GU	± 0.2 %
Reproducibility	± 0.2 GU	± 0.5 GU	± 0.5 %



Gloss Measurement for Specific Applications

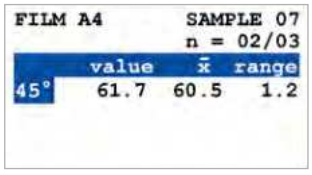
Specific materials require specific measuring angles: Ceramic materials, plastic films and solid plastics, paper and paperboard either measure specular gloss at the standard geometries 20°, 60°, 85° or at industry specific geometries 45° or 75°.

micro-gloss 45°: Specialized glossmeter for ceramics, plastics and plastic films.

micro-gloss 45°

Plastic films and solid plastics, both opaque and transparent, are often measured at 45° angle for intermediate and low gloss levels. For films that transmit light, a matte black backing such as "Black scrub panel" cat. no 5015 (see page 174), must be placed behind the sample. Erroneous measurements will occur without a suitable backing.

Standard test methods ask for readings on at least three portions of each specimen to get an indication of gloss uniformity. The statistic mode of the micro-gloss will show the average and range or standard deviation as a measure of sample uniformity.



Ceramics, porcelain enamels and other finishes use the 45° geometry and often provide a comparison of their resistance to acid, alkali, or other environmental factors by measurement of gloss loss.

$$\text{Gloss loss, \%} = 100 \times \frac{G_{initial} - G_{final}}{G_{initial}}$$

In order to evaluate change of gloss it is essential to take multiple readings over the entire sample surface and evaluate the average to ensure representative results.

Standards

ASTM	C346, D2457
JIS	Z8741

Technical Specifications

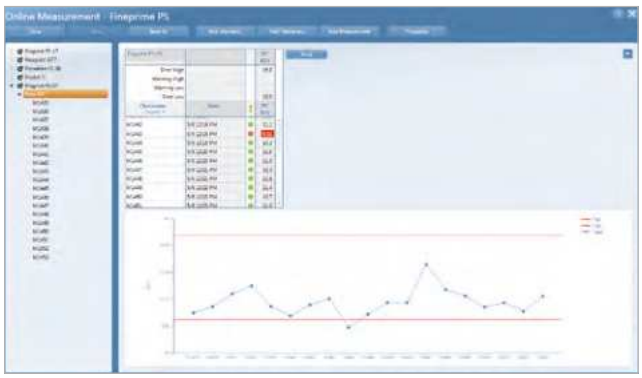
Geometry	Application	Measurement Range
45°	Ceramic, Plastic, Plastic Films	0 - 180 GU

Gloss Measurement for Specific Applications

micro-gloss 75°

Especially coated paper, but also a variety of uncoated papers request gloss control. The 75° geometry is suitable for most ink films on paper and paperboard. Color differences have a negligible influence on measured gloss. For example, a white surface will measure less than one gloss unit higher than an otherwiese identical black surface.

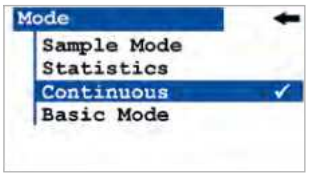
Very high gloss papers (laquered, highly varnished or waxed) should use a 20° measurement geometry. As defined in the TAPPI standard for bath QC at least ten test specimens free from folds or wrinkles or other imperfections are to be checked. The smart-lab Gloss software is ideal to document and communicate the measurement results. Its project management can be used to record the quality of one material over time and send the data either by PDF or Excel to all involved parties.



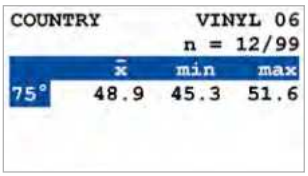
Another typical material to be tested for specular gloss using the 75° geometry is vinyl siding made principally from rigid PVC and is used to clad exterior walls of buildings.

In order to evaluate the uniformity over large areas, the "Continuous mode" of the micro-gloss will display the gloss values in a predefined measurement interval while movin the instrument over the surface.

select Continuous mode...



and measure:



micro-gloss 75°: Specialized glossmeter for paper, paperboard and structured plastic e.g. vinyl siding.

Standards

ASTM	D2457, D3679
JIS	Z8741
TAPPI	T480

Technical Specifications

Geometry	Application	Measurement Range
75°	Paper, Vinyl Siding	0 - 140 GU

smart-chart

The smart way to communicate

smart-lab Gloss

- Measure your products offline or online and transfer the results to smart-lab Gloss. Immediately, you will get a professional QC-report, including data table and graph.
- Setup your product specifications in the Standard management module, with Pass – Warning – Fail limits for display in your QC-reports.
- Manage your lab work in projects to show production process stability using trend reports.

smart-process Gloss

- Ideal for products with multiple measurement locations.
- Setup Organizers for menu guided test sequences and clear sample identification.
- Efficient QC analysis for process control with a high sampling rate. The data are saved in a SQL database which allows handling of large data sets over a long time period.
- Flexible data analysis based on defined identification parameters for a certain time range. Monitor your process stability with scorecards, trend reports and SPC charts (box plot).

In compliance with:

Standards

ISO	2813, 7668
ASTM	D 523, D 2457
DIN	67530
JIS	Z 8741

Ordering Information

Cat. No.	Description
4560	micro-gloss 20°
4561	micro-gloss 60°
4562	micro-gloss 85°
4563	micro-TRI-gloss
4564	micro-TRI-gloss µ
4565	micro-gloss 60° S
4566	micro-TRI-gloss S
4567	micro-gloss 45°
4568	micro-gloss 75°
4569	micro-gloss 60° XS
4570	micro-gloss 60° XS-S
4573	micro-gloss 60° robotic
4576	micro-gloss 60° S robotic

Comes complete with:
Glossmeter
Holder with integrated calibration tile
Traceable certificate
USB-cable, Battery
Operating manual
Carrying case
Software for download:
smart-lab Gloss or smart-process Gloss with 2 licenses

Note: After software download both software packages can beused for 30 days free trail. 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, 2.5 GHz, i7 recommended or equivalent
Memory: 4 GB RAM, 8 GB recomended
Hard-disc capacity: 2 GB during installation
Monitor resolution: 1280 x 1024 pixel or higher
Interface: free USB-por

Technical Specifications

Geometry	Application	Measuring Area
20°	high gloss	10 x 10 mm (0.4 x 0.4 in)
60°	semi gloss	9 x 15 mm (0.35 x 0.6 in)
85°	low gloss	5 x 38 mm (0.2 x 1.5 in)
20°, 60°, 85°	universal	see single angle
20°, 60°, 85°	universal	see single angle
60°	semi gloss	9 x 15 mm (0.35 x 0.6 in)
20°, 60°, 85°	universal	see single angle
45°	Ceramic, Plastic, Film	9 x 13 mm (0.35 x 0.5 in)
75°	Paper, Vinyl Siding	7 x 24 mm (0.3 x 0.95 in)
60°	semi gloss	2 x 4 mm (0.08 x 0.16 in)
60°	semi gloss	2 x 4 mm (0.08 x 0.16 in)
60°	semi gloss	9 x 15 mm (0.35 x 0.6 in)
60°	semi gloss	9 x 15 mm (0.35 x 0.6 in)

Measurement range[1]	0 - 100 GU	100 - 2000 GU
Repeatability[2]	± 0.2 GU	± 0.2 %
Reproducibility[2]	± 0.5 GU	± 0.5 %
Spectral sensitivity	CIE standard observer for illuminant CIE-C	
Measuring time	0.5 seconds / geometry	
Thickness:		
Substrate	Fe: magnetic, NFe: non-magnetic	
Measurement Range	0 - 500 µm (0 - 20 mils)	
Accuracy	± (1.5 µm +2% of measured value)	
Memory	999 readings with date and time	
Interface	USB	
Power supply	one 1.5V AA Alkaline Battery 4,000 readings or via USB-port	
Dimensions	155 x 73 x 48 mm (6.1 x 2.9 x 1.9 in)	
Weight	0.4 kg (0.9 lbs)	
Operating temperature	15 - 40 °C (60 - 104 °F)	
Relative humidity	up to 85 %, non-condensing	

[1] for 45° and 75° glossmeters see previous pages

[2] for S-Type glossmeters see previous page

Ordering Information

Cat. No.	Description
4405	USB-Cable micro-gloss family
4866	Software smart-lab Gloss
4867	Software smart-process Gloss

Note: smart-chart license fee for more than two installations is quantity dependent. Please contact your local BYK-Gardner representative.

Accessories

For data transfer from the glossmeter to a PC, USB-A	
Software for professional analysis and documentation in the laboratory	
Process QC Software for analysis of multi-component products	
Export / Import	Standards (.xml format) Organizer (.xml format)
Languages	English, German, French, Italian, Spanish, Chinese, Japanese

Accessories for Cosmetics

Measurement of cosmetic products

The cosmetic industry is very much driven by aesthetics. Conistent raw materials and stable process parameters are the key to uniform and repeatable color and appearance quality. For each different product type (e.g. nail polish, lip gloss, eye shadow, foundation...) a standardized sample preparation is required in order to guarantee repeatable measurement results.

Measurement of cylindrical products

Sample Holder Cosmetics

The Sample Holder Cosmetics is espacially designed for gloss measurements using micro-gloss on cylindrical shaped products, e.g.

- Cosmetic Packaging such as hairspray cans

For repeateble results the product is placed into a sample drawer, which can be comfortably opened and closed. Magnets keep the drawer to hold the micro-gloss in place and allow non-contact measurements of your products in a completely shielded compartment.

- Easy-handling
- Precise and repeatable positioning of sample
- No ambient light
- Durable, easy-to-clean material
- Non-contact measurement

For gloss measurements using micro-gloss on cylindrical shaped products the Sample Holder Cosmetics is used together with a Cylinder Kit:

- Customizable inlays for various diameters of clyindrical shaped products
- Optimum form closure guarantees tight fit of inlays inside the holder

Ordering Information

Cat. No.	Description
6469	Sample Holder Cosmetics
6464	Cylinder Kit

Accessories

Dimensions: 24 x 10 x 10 cm (9.4 x 3.9 x 3.9 in.)
Weight: 2.2 kg (4.9 lbs)

Max. length of cylinder: 229 mm
Max. diameter of cylinder: 67 mm
Please provide sample for customization of inlays

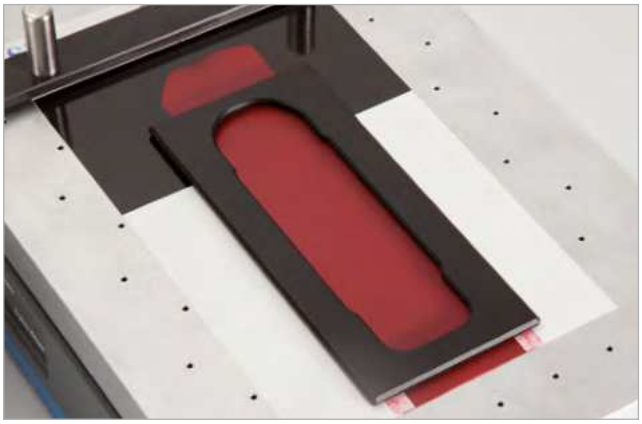
Measurement of wet drawdowns

Wet Drawdown Template – G

The Wet Drawdown Template – G is espacielly designed for gloss measurements using micro-gloss on non-drying drawdowns, e.g.

- Drawdowns of Lipstick Paste
- Drawdowns of Liquid Foundation

To simulate how the gloss of a product will look like when applied, a drawdown is made on a test chart. The template is then placed over the drawdown without touching the surface of the wet sample. For repeateble non-contact measurements, the template ist equipped with a mask to hold the the micro-gloss.



- Made of easy-to-clean hard-anodized aluminium
- Non-contact measurement ensure clean and fast handling

Ordering Information

Cat. No.	Description
4439	Wet Drawdown Template – G

Accessories

Dimensions: 10.0 x 17.0 cm (3.94 x 6.69 in.)
Min. Film Width: 35 mm (1.38 in.)
Max. Film Width: 80 mm (3.15 in.)

Info! Measurement results are greatly affected by application quality. Therefore the use of an automatic film applicator (e.g. byko-drive) is recommended. For more information please refer to the section “Application”.

Measurement of powdery or pasty products

Sample Holder Round Dish – G

The Sample Holder Round Dish – G is developed for gloss measurement using micro-gloss on powdery or pasty materials, e.g.

- Pressed Powders
- Creamy Eye Shadows

For repeatable results the product is pressed or pured into a sample cup. During sample preparation of pressed powders, it is important to always maintain the same plunger pressure as well as the same plunger tissue. It is recommended to use a fine-woven fabric to create a smooth, non-textured surface. The holder is equipped with a mask onto which the micro-gloss is placed for non-contact measurements.

- Made of easy-to-clean hard-anodized aluminium
- Non-contact measurement to protect the instruments optics
- Customized adapter rings are offered to use the holder with custom specific cuvettes

Ordering Information

Cat. No.	Description
4453	Sample Holder Round Dish – G
6416	Adapter Rings for 4453

Accessories

Including adapter ring and 5 sample dishes ø 35.5 mm, height 4.5 mm, Measurement distance approx. 1 mm
Five adapter rings of various sizes Please specify diameter (max. size of sample dish: ø 60 mm)

Calibration Holder

Replacement holder with high gloss calibration tile.

Ordering Information

Cat. No.	Description
4441	Calibration Holder 20°
4443	Calibration Holder 60°
4445	Calibration Holder 85°
4447	Calibration Holder TRI
4455	Calibration Holder 45°
4457	Calibration Holder 75°
4559	Calibration Holder 60°XS

Comes complete with:
Holder with integrated calibration tile and traceable certificate

Checking Standard

In order to control the performance and linearity of the glossmeter it is recommended to use a checking standard periodically. The control interval is dependent on the usage conditions of the glossmeter.
The gloss tiles are built into an aluminum track that the glossmeter fits into to guarantee accurate and repeatable measurements. The included certificate is traceable to international institutes.

Ordering Information

Technical Specifications

Cat. No.	Description	Dimensions	
4422	Checking Standard micro 20°	170 x 103 x 17 mm (6.7 x 4.1 x 0.7 in)	High and semi gloss tile
4462	Checking Standard micro 60°	170 x 103 x 17 mm (6.7 x 4.1 x 0.7 in)	High and semi gloss tile
4464	Checking Standard micro 60° S	170 x 103 x 17 mm (6.7 x 4.1 x 0.7 in)	High gloss and low gloss tile, approx. 5 GU at 60°
4487	Checking Standard micro 85°	170 x 103 x 17 mm (6.7 x 4.1 x 0.7 in)	High and semi gloss tile
4434	Checking Standard TRI	170 x 103 x 26 mm (6.7 x 4.1 x 1 in)	High gloss and 3 semi gloss tiles 20°, 60°, 85°
4438	Checking Standard micro-TRI S	170 x 103 x 26 mm (6.7 x 4.1 x 1 in)	High gloss and 3 semi gloss tiles 20°, 60°, 85°, 60° tile approx. 5 GU
4433	Checking Standard Mirror, TRI	170 x 103 x 26 mm (6.7 x 4.1 x 1 in)	High gloss and 3 semi gloss tiles 20°, 60°, 85°, highly reflective
4458	Checking Standard micro 45°	170 x 103 x 17 mm (6.7 x 4.1 x 0.7 in)	High and semi gloss tile
4459	Checking Standard micro 75°	170 x 103 x 17 mm (6.7 x 4.1 x 0.7 in)	High and semi gloss tile
4490	Checking Standard micro 60°XS	170 x 103 x 17 mm (6.7 x 4.1 x 0.7 in)	High and semi gloss tile
4493	Checking Standard micro 60°XS Mirror	170 x 103 x 17 mm (6.7 x 4.1 x 0.7 in)	High and semi gloss tile, highly reflective

Comes complete with:
Checking standard in aluminum track with traceable certificate

Glossmeter Accessories

Additional Standards

These 100 x 100 mm (4 x 4 in) glass tiles can be used for any glossmeter as a reference. If standards with specific values are needed, ask for Cat. No. 4057 or 4058.

Ordering Information

Cat. No.	Description
4050	High Gloss Standard
4051	Semi Gloss Standard 20°
4052	Semi Gloss Standard 60°
4053	Semi Gloss Standard 85°
4056	Mirror Gloss Standard
4057	Special Standard, Black Glass
4058	Special Standard, Mirror

Technical Specifications

	Black glass tile, polished, for 20°, 60°, 85°
	Black glass tile, 20° value approx. 60 to 70 gloss units
	Black glass tile, 60° value approx. 40 to 50 gloss units
	Black glass tile, 85° value approx. 15 to 25 gloss units
	High gloss, polished mirror, for 20°, 60°, 85°
	Black glass tile, gloss value can be defined
	Semi gloss, highly reflective, gloss value can be defined

Comes complete with:
Standard
Traceable certificate
Protective case