



www.rhopointinstruments.com

RHOPOINT 

- 20° GLOSSMETER
- DOI METER
- HAZE METER
- GONIOPHOTOMETER


Rhopoint Instruments Limited
is a member of the
Rhopoint Group

MEASUREMENT THEORY

WHY MEASURE GLOSS?

Gloss is an aspect of the visual perception of objects that is as important as colour when considering the psychological impact of products on a consumer.

It has been defined as 'The attribute of surfaces that causes them to have a shiny or lustrous, metallic appearance.'

The gloss of a surface can be greatly influenced by a number of factors, for example the smoothness achieved during polishing, the amount and type of coating applied or the quality of the substrate.

Manufacturers design their products to have maximum appeal: from highly reflective car body panels to glossy magazine covers or matt finish automotive interior trim.



It is important therefore that gloss levels are achieved consistently on every product or across different batches of products.

This is especially noticeable where parts may be produced by different manufacturers or factories but will be placed adjacent to one another to create the finished product.



Gloss can also be a measure of the quality of the surface, for instance a drop in the gloss of a coated surface may indicate problems with its cure, leading to other failures such as poor adhesion or lack of protection for the coated surface.

It is for these reasons that many manufacturing industries monitor the gloss of their products, from cars, printing and furniture to food, pharmaceuticals and consumer electronics.

HOW IS GLOSS MEASURED?

Gloss is measured by shining a known amount of light at a surface and quantifying the reflectance. The angle of the light and the method by which the reflectance is measured are determined by surface and also aspect of the surface appearance to be measured.



WHICH ANGLE SHOULD I USE FOR MY APPLICATION?

ISO 2813 and ASTM D523 (the most commonly used standards) describe three measurement angles to measure gloss across all surfaces.

Gloss is measured in gloss units (GU) and is traceable to reference standards held at NIST (USA) or NPL (UK).

Universal Measurement Angle: 60°

All gloss levels can be measured using the standard measurement angle of 60°. This is used as the reference angle with the complimentary angles of 85° and 20° often used for low and high gloss levels respectively.

Low Gloss: 85°

For improved resolution of low gloss a grazing angle of 85° is used to measure the surface. This angle is recommended for surfaces which measure less than 10GU when measured at 60°. This angle also has a larger measurement spot which will average out differences in the gloss of textured or slightly uneven surfaces.

High Gloss: 20°

The acute measurement angle of 20° gives improved resolution for high gloss surfaces. Surfaces that measure 70GU and above at the standard angle of 60° are often measured with this geometry. The 20° angle is more sensitive to haze effects that affect the appearance of a surface.

THE RHOPOINT IQ FLEX 20 QUANTIFIES SURFACE QUALITY PROBLEMS THAT ARE INVISIBLE TO A STANDARD GLOSSMETER

The Rhopoint IQ FLEX 20 measures reflected image quality; it is the only hand held instrument that profiles how light is reflected from a surface. Glossmeters are usually used to measure the shininess of a surface but are not sensitive to common effects which reduce appearance quality



Orange peel dramatically reduces appearance quality without affecting gloss readings. These two test panels measure identically with a standard glossmeter.

The Rhopoint IQ FLEX 20 with RIQ/DOI measurement can quantify the differences



Haze is a common problem associated with coatings and polished materials. Surfaces with haze have a milky finish with a shallow reflected image.

This important characteristic is directly measured with the Rhopoint IQ Flex 20.

THE RHOPOINT IQ FLEX 20 MEASURES

20° GLOSS • RSPEC • REFLECTANCE HAZE
REFLECTED IMAGE QUALITY • DISTINCTNESS OF IMAGE
GONIOPHOTOMETRIC CURVES

REFLECTANCE HAZE – An optical effect caused by microscopic texture or residue on a surface.

Visible symptoms: A milky finish is apparent on the surface with a loss of reflected contrast. Halos and patterns can be seen around reflections of high intensity light sources.

Causes: Poor dispersion, raw material incompatibility, additive migration, vehicle quality, stoving/drying/curing conditions, polishing marks, fine scratches, ageing, oxidation, poor cleanliness/surface residue.

REFLECTANCE HAZE COMPENSATION – The instrument compensates for reflection from within the coating for highly reflective pigments, metallic coatings and speciality pigments, allowing the haze of any painted surface to be measured.

REFLECTED IMAGE QUALITY (RIQ) – RIQ is used to quantify effects such as orange peel and surface waviness. This new parameter gives higher resolution results compared to Distinctness of Image (DOI) measurement and better mimics human perception of surface texture, especially on high quality finishes such as automotive.

Symptoms of poor RIQ: Orange peel, brush marks, waviness or other structures visible on the surface. Reflected images are distorted.

Causes: Application problems, incorrect coating flow, coating viscosity too high/low, sag or flow of coating before curing, incorrect particle size/distribution, overspray, improper flash/recoat time, inter coat compatibility, incorrect cure times and cure temperature.

DISTINCTNESS OF IMAGE (DOI) – A measure of how clearly a reflected image will appear in a reflective surface.



WHY MEASURE HAZE?

Haze can be described as near specular reflection. It is caused by a microscopic surface structure which slightly changes the direction of a reflected light causing a bloom adjacent to the specular (gloss) angle. The surface has less reflective contrast and a shallow milky effect. In the coatings industry, this microscopic surface texture is often due to poorly dispersed raw materials, incompatible raw materials or oxidation and weathering.

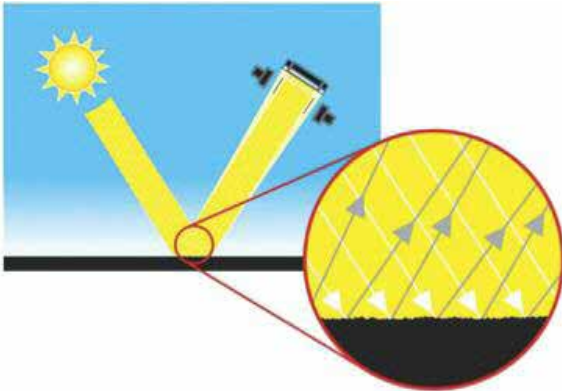
For polished metal surfaces haze is often associated with polishing marks or chemical residue.



Haze

Haze is light that has been reflected by small surface structures adjacent to the main specular component.

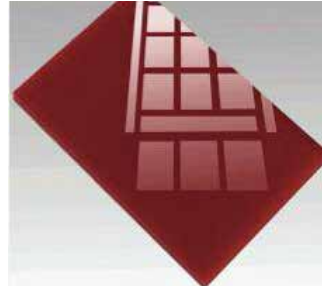
$$\text{Haze } \alpha = \frac{\text{Haze reflectance}}{\text{Incident}}$$



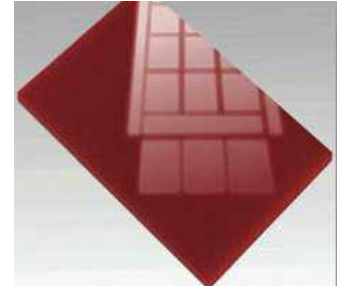
REFLECTANCE HAZE – An optical effect caused by microscopic texture or residue on a surface.

REFLECTION HAZE

Reflection haze is an optical phenomenon usually associated with high gloss surfaces. It is a common surface fault that reduces appearance quality. A hazy surface has a visibly shallower reflection with a milky finish and halos appear around reflections of strong light sources.



Sample 1- No Haze, deep reflection



Sample 2- High Haze, 'shallow' finish

A high gloss finish with haze exhibits a milky finish with low reflective contrast- reflected highlights and lowlights are less pronounced.



Sample 3- Low Haze



Sample 4- Higher Haze

On surfaces with haze, halos are visible around the reflections of strong light sources.

Causes of Haze

Coating & Raw Materials

- Dispersion
- Pigment properties
- Particle size
- Binder compatibility
- Influence and migration of additives
- Resin types and quality

Curing

- Drying conditions
- Cure temperature

Post Coating

- Polishing marks
- Cleanliness
- Ageing and oxidation

Haze: Often visible as milky finish on high gloss surfaces



GLOSS & HAZE MEASUREMENT WITH ARRAY TECHNOLOGY

The Rhopoint IQ uses a 512 element linear diode array which profiles reflected light in a large arc from 14° to 27°. The instrument processes this high resolution data, selecting individual elements within the array that equate to the angular tolerances outlined in international measurement standards.

In a single 20° measurement, the following calculations are made:

$$\text{Gloss} = \frac{\sum \text{Pixels between } 20^\circ \pm 0.9^\circ \text{ (sample)}}{\sum \text{Pixels between } 20^\circ \pm 0.9^\circ \text{ (standard)}}$$

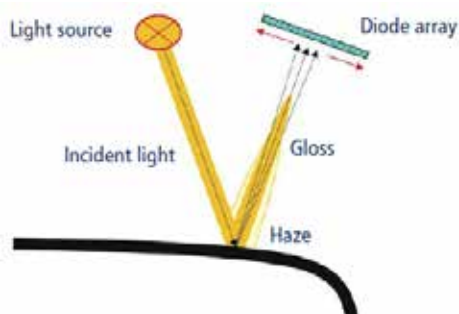
$$\text{Haze} = 100 * \frac{\sum \text{Pixels from } 17^\circ \text{ to } 19^\circ \text{ (sample)} + \sum \text{Pixels from } 21^\circ \text{ to } 23^\circ \text{ (sample)}}{\text{Specular Gloss (Standard)}}$$

$$\log \text{Haze} = 1285(\log_{10}((\text{Haze}/20)+1))$$

CURVED SURFACE ADJUSTMENT

A major advantage of the Rhopoint IQ is that it automatically compensates for curved or textured sample surfaces by virtually adjusting the measurement position. Conventional gloss-hazemeters have fixed optics which can make measurement unreliable as any sample curvature will reflect light away from the centre of the measurement sensor causing errors.

The Rhopoint IQ automatically adjusts the sensor position by detecting the peak of the reflected light. The laws of reflection state that the incident angle is equal to the reflection angle thus the peak equates exactly to the 20° gloss angle.



The Rhopoint IQ automatically adjusts for non-flat surfaces by sensing the reflected peak and virtually adjusting the position of the sensor.

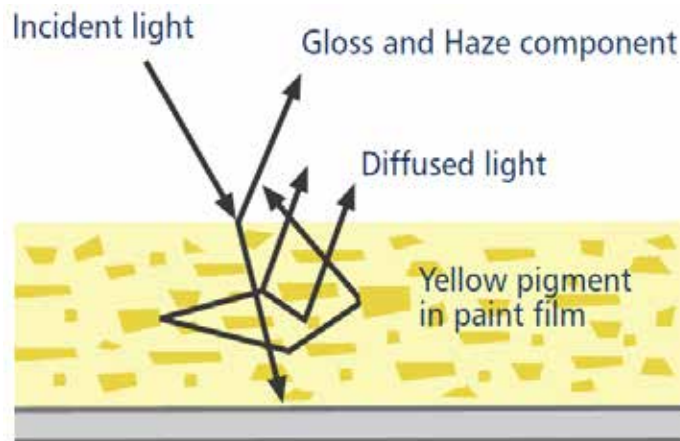
DIFFUSE CORRECTED MEASUREMENT

Reflection haze is caused by micro texture on a surface which causes a small amount of light to be reflected adjacent to the gloss angle.

For white surfaces, bright colours and metallics, a certain amount of diffuse light, reflected from within the material, is also present in this region.

This diffuse light exaggerates the haze signal for these surfaces causing higher than expected readings.

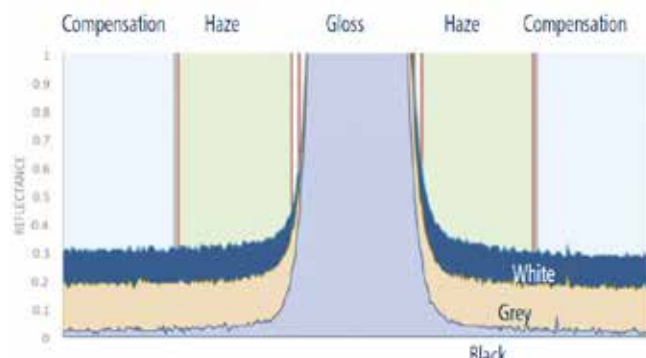
* Only enabled when the instrument is set to haze measuring mode of ASTM E430



The Rhopoint IQ compensates for reflection from within the coating for highly reflective pigments, metallic coatings and speciality pigments, allowing the haze of any painted surface to be measured.

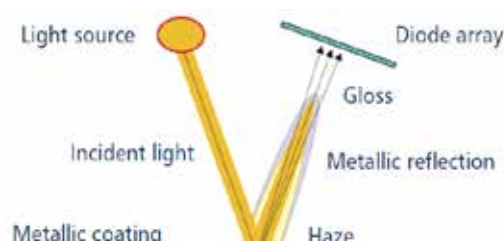
CORRECTED HAZE MEASUREMENT ON

For non metallic surfaces, the diffuse component is Lambertian: it is equal in amplitude at all angles in relation to the sample surface. Conventional gloss-hazemeters measure diffuse reflection using a luminosity sensor positioned away from the gloss angle. Luminosity is subtracted from the haze signal allowing non metallic surfaces to be measured independently of their colour.



Goniophotometric information profiling the reflection from white, grey and black panels with an identical topcoat.

An advantage of the Rhopoint IQ is that unlike a conventional instrument, compensation is calculated using a region adjacent to the haze angle. This technique gives compatible readings on solid colours but also compensates for directional reflection from metallic coatings and speciality pigments.



The Rhopoint IQ captures compensation information from a region adjacent to the haze measurement angle. This means it can be used on metallic coatings which reflect light directionally.

The Rhopoint IQ GLOSS-HAZE-DOI-GONIOPHOTOMETER has been established as the reference instrument for measuring reflective appearance. Combined gloss, haze and orange peel (DOI/RIQ values) information has made the IQ essential for controlling appearance finish.

The **Rhopoint IQ FLEX 20** brings this technology to a new format specifically designed for **curved surfaces** and **small & delicate parts**.



EASY CUSTOMISATION FOR EVERY APPLICATION

Measurement of curved surfaces*

Conventional gloss instruments are best suited to large flat areas and test panels, as curved surfaces cause measurement errors. The small footprint of the IQ FLEX 20 makes it much more effective on curved surfaces than a conventional glossmeter; its compact size and shape also allows access to difficult to reach areas.

- Curved surfaces.



Measurement of small surfaces

The Rhopoint IQ FLEX 20 can be customised with the magnetically attached adaptor plates. These can be easily interchanged for different applications.



- Reduced measurement spot sizes



(4 & 2mm) for small parts.



Bespoke measuring heads

- Bespoke 3D printed adaptor jigs for repeatable control of curved surfaces.



Convex surface

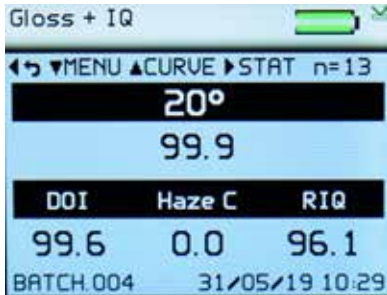


Concave surface

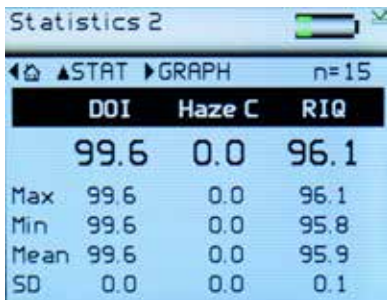


Complex curve

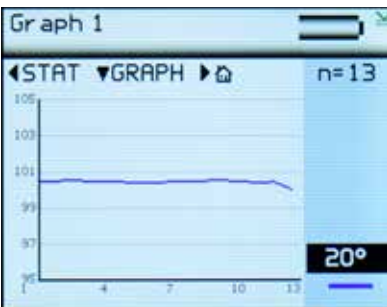
* Requires an adaptor



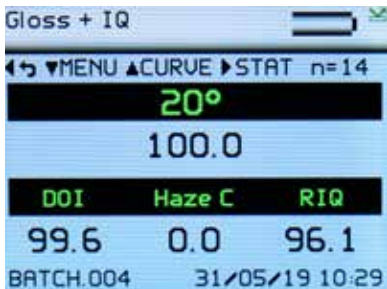
Simultaneous measurement of all parameters, date and time stamped.



Displays full statistics for the readings in the current batch.



Graphical reporting for quick trend analysis.



Pass / fail parameters can be defined for instant identification of non-conformances

Goniophotometric Curves

Different types of surface textures produce identifiably shaped reflectance profile. This goniophotometric data can be downloaded to PC for further analysis and comparison via the USB cable or Bluetooth Data Widget.



Software-free data transfer

USB connection to PC instantly recognises the device as a drive location which facilitates the quick transfer of .CSV files using Windows Explorer or similar.

Batch	BatTime	Date	Time	Pass/Fail	GLOSS 20	HAZE	LOG HAZE	DOI	RSPEC	Cdiode	CALIBRATED	CERTIFIED	SERIAL NO	RIQ	PCB temp	Env. temp.
001	10:50:30	02/07/19	10:50:30	N/A	100.35	0	0.34	99.07	97.17	230	02/07/19	02/07/19	1181180	96.62	26.83	26.56
001	10:50:30	02/07/19	10:50:32	N/A	100.43	0	0	99.07	97.16	230	02/07/19	02/07/19	1181180	96.63	26.64	26.56
001	10:50:30	02/07/19	10:50:34	N/A	100.43	0.01	0.17	99.08	97.09	230	02/07/19	02/07/19	1181180	96.62	26.64	26.62
001	10:50:30	02/07/19	10:50:36	N/A	100.47	0	0	99.08	97.08	230	02/07/19	02/07/19	1181180	96.64	26.83	26.69
001	10:50:30	02/07/19	10:50:38	N/A	100.52	0	0	99.08	97.06	230	02/07/19	02/07/19	1181180	96.65	27.01	26.69
001	10:50:30	02/07/19	10:50:40	N/A	100.51	0.01	0	99.08	97.16	230	02/07/19	02/07/19	1181180	96.63	26.83	26.75
001	10:50:30	02/07/19	10:50:42	N/A	100.47	0	0.01	99.08	97.14	230	02/07/19	02/07/19	1181180	96.62	26.83	26.76
001	10:50:30	02/07/19	10:50:44	N/A	100.54	0	0	99.09	97.18	230	02/07/19	02/07/19	1181180	96.65	26.83	26.75
001	10:50:30	02/07/19	10:50:46	N/A	100.47	0	0	99.08	97.18	230	02/07/19	02/07/19	1181180	96.63	27.01	26.81
001	10:50:30	02/07/19	10:50:48	N/A	100.54	0	0	99.09	97.19	230	02/07/19	02/07/19	1181180	96.64	26.73	26.81
002	10:54:33	02/07/19	10:54:33	N/A	100.47	0	0	99.08	97.15	230	02/07/19	02/07/19	1181180	96.68	27.01	26.81
002	10:54:33	02/07/19	10:54:35	N/A	100.39	0.01	0.26	99.08	97.14	230	02/07/19	02/07/19	1181180	96.68	27.01	26.88
002	10:54:33	02/07/19	10:54:37	N/A	100.5	0	0	99.07	97.16	230	02/07/19	02/07/19	1181180	996.67	27.01	26.94
002	10:54:33	02/07/19	10:54:39	N/A	100.6	0	0	99.06	97.16	230	02/07/19	02/07/19	1181180	96.68	27.01	26.04
002	10:54:33	02/07/19	10:54:41	N/A	100.52	0	0	99.07	97.19	230	02/07/19	02/07/19	1181180	96.68	27.01	26.94
002	10:54:33	02/07/19	10:54:43	N/A	100.57	0	0	99.09	97.18	230	02/07/19	02/07/19	1181180	96.63	27.01	27
002	10:54:33	02/07/19	10:54:45	N/A	100.55	0	0	99.08	97.18	230	02/07/19	02/07/19	1181180	96.63	27.19	27
002	10:54:33	02/07/19	10:54:47	N/A	100.61	0	0	99.08	97.18	230	02/07/19	02/07/19	1181180	96.62	27.19	27
002	10:54:33	02/07/19	10:54:49	N/A	100.5	0.01	0.28	99.09	97.15	230	02/07/19	02/07/19	1181180	96.64	27.19	27
002	10:54:33	02/07/19	10:54:51	N/A	100.11	0.01	0.17	99.07	97.18	230	02/07/19	02/07/19	1181180	96.64	27.01	27.06
002	10:54:33	02/07/19	10:54:53	N/A	100.87	0	0	99.12	97.20	230	02/07/19	02/07/19	1181180	96.66	27.19	27.06

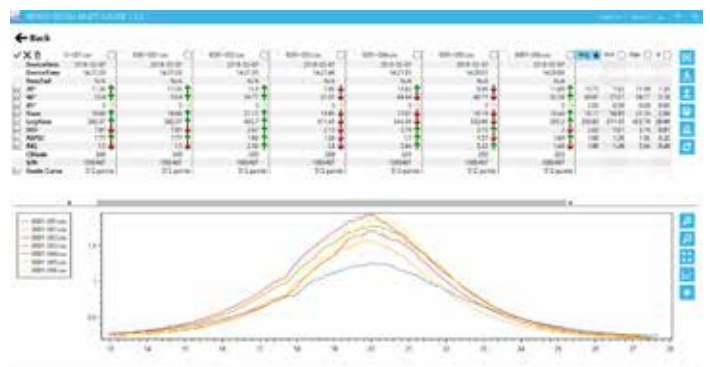
Direct data input via BT wireless

Instantly transmit measured readings directly to programs such as MS Excel on your PC / tablet to greatly simplify the reporting process.

	1	2	3	4	5	6
DATE	02/07/19	02/07/19	02/07/19	02/07/19	02/07/19	02/07/19
TIME	11:16:24	11:16:42	11:17:17	11:17:37	11:17:58	11:18:29
20	10.4	10.4	10.6	10.6	10.6	10.6
LogHAZE	222.2	221.9	225.5	225.7	225.5	225.5
DOI	10.4	10.4	9.7	9.7	9.7	9.8
RIQ	6.6	6.5	7.1	7.0	7.2	7.2
Cdiode	227	227	223	223	223	223
Calibrated	02/07/19	02/07/19	02/07/19	02/07/19	02/07/19	02/07/19
Serviced	02/07/19	02/07/19	02/07/19	02/07/19	02/07/19	02/07/19
S/N	1181180	1181180	1181180	1181180	1181180	1181180

Statistical analysis via Novo-Gloss Multi Gauge software

The included software provides an easy means to measure, import and compare data and export the measurements into several other file formats, e.g. PDF, Excel® or CSV.



View and inspect data saved on the instrument



CONFIGURING THE IQ FLEX 20

Absolute v comparative measurement

Sample curvature naturally reflects light away from the measurement sensor. This can be compensated by using a smaller measurement spot which is less affected by the curvature. However, on highly curved surfaces readings should be used comparatively i.e. the same spot on similar shaped samples and is therefore ideal for comparing batch to batch consistency.



Repeatability

	IQ Flex 20	4mm Reduced Spot size adaptor	2mm Reduced Spot size adaptor	Curved part adaptor	Custom 3d printed adaptor
Flat surface	Excellent	Excellent	Excellent	Excellent	N/A
Large radius curved e.g. car body	Good	Good	Good	Good	Excellent
Cylinder > 20mm diameter	Poor	Poor	Poor	Good	Excellent
Cylinder < 20mm diameter	Not recommended	Not recommended	Not recommended	Poor	Varies according to application
Small flat parts > 10 x 10mm	Excellent	Excellent	Excellent	Not recommended	Excellent
Small flat parts < 10 x 10mm	Poor	Varies according to application	Varies according to application	Not recommended	Excellent
Complex shapes (curved in both directions)	Not recommended	Not recommended	Not recommended	Not recommended	Excellent

Above comments are made with measuring head used correctly as described in figure 1

CORRELATION TO STANDARD GLOSSMETER READINGS BY GLOSS LEVEL

	IQ Flex 20	4mm	2mm	Curved part adaptor	Custom 3d printed adaptor
Flat surface – high gloss > 50GU at 20°	Excellent	Excellent	Excellent	Excellent	N/A
Flat surface – mid gloss 30-50GU at 20°	Excellent	Good	Good	Excellent	N/A
Flat surface – low gloss < 20 at 20°	Excellent	Good	Not recommended	Excellent	N/A

Above comments are made with measuring head used correctly as described in figure 1

CORRELATION TO STANDARD GLOSSMETER READINGS BY SAMPLE SHAPE

	IQ Flex 20	4mm	2mm	Curved part adaptor	Custom 3d printed adaptor
Large radius curved (car body)	Good	Good	Good	Good	Excellent
Cylinder > 20mm Diameter	Good	Good	Good	Good	Excellent
Cylinder > 20mm diameter	Comparative Reading	Comparative Reading	Comparative Reading	Comparative Reading	Comparative Reading
Cylinder < 20mm diameter	Not recommended	Not recommended	Not recommended	Poor	Varies according to application
Small flat parts	Excellent areas > 8mm x 8mm	Good > 4mm x 4mm	High gloss: Good Areas > 2mm x 2mm Poor for low gloss finishes	Not recommended	Excellent
Complex shapes (curved in both directions)	N/A	N/A	N/A	N/A	Comparative readings only

Above comments are made with measuring head used correctly as described in figure 1

INCREASING MEASUREMENT REPEATABILITY

Q. When should I use a custom adaptor?

A. To increase repeatability of measurements on curved surfaces or small parts - essential for complex curves.

ADAPTORS

Q. When do I use the curved part adaptor?

A. This should be used for the measurement of all cylindrical objects

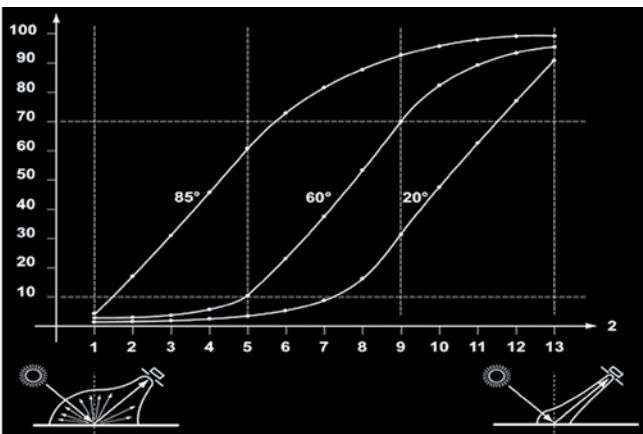
WHAT GLOSS LEVELS CAN BE MEASURED WITH THE FLEX 20

Q. ISO2813 recommends surfaces measuring mid to low gloss finishes using 60 and 85 deg. Is the flex 20 suitable for measuring these surfaces?

A. Yes, see table above.

60 and 85 give greater resolution of measurement at these gloss levels (small visible differences in finish = a large difference in gloss value).

Whilst 20 has a smaller measurement resolution, visible differences in gloss can be quantified with the Flex 20



ADAPTORS

Q. **Why should I use a custom adaptor:**
 A. This will increase the repeatability of measurement for irregular shaped objects.



Comparisons can only be made between readings of the same adaptor type.

MAKING A MEASUREMENT

- Ensure that the instrument is calibrated following the procedure in the product manual.
- Select the measuring appropriate for the surface to be measured.
- Place the measuring head on the surface and hold this as indicated in figure 1.
- Ensure that the no ambient light can be detected by the measuring head.



Figure 1.

CALIBRATION GUIDE

	Measuring less than 100 GU (plastics and coatings)	Measuring polished metals >100GU
Standard Spot Size	Calibrate on black tile every shift (8 Hours) -MUST BE RE-CALIBRATED with standard spot size adaptor when switching from small spot size measurement.	Calibrate on optional mirror tile (if required) -MUST BE RE-CALIBRATED with standard spot size adaptor when switching from small spot size measurement.
Small spot size	-Calibrate with small spot size adaptor (8 Hours) -MUST BE RE-CALIBRATED with small spot size adaptor when switching from standard spot size measurement.	Calibrate on optional mirror tile (8 Hours) -MUST BE RE-CALIBRATED with small spot size adaptor when switching from standard spot size measurement.



SAMPLE APPLICATIONS



Automotive - Body



Yacht Manufacturers



Mobile Phones



Tablet PC



Automotive Interior



Curved Surfaces



PVC



Plastics Industry



Polished Metals

INSTRUMENT SPECIFICATION

Operation

- | Full colour easy to read screen
- | Adjustable brightness
- | 6 button touch sensitive interface
- | Auto-rotating measurement screen

Construction

- | All aluminium construction - enclosure, optics, standard holder

Measurement

- | Single button push to measure all parameters
- | Fast Measurement
- | Results batching with user definable names

Statistical Analysis

- | SD, all measured parameters

Graphical Analysis

- | On board trend analysis of gloss and IQ values

Power

- | Rechargeable lithium ion
- | 17+ hours operation
- | 4,000+ readings per charge

Recharge Time

- | Mains charger: 4hrs

Memory

- | 8 MB = 999 readings
- | User definable alphanumeric batching

Data Transfer

- | PC compatible
- | USB connection, no software installation required

Measurement Area

- | Remote control via USB / Bluetooth
- | 20° = 6mm x 6.39 ellipse

Options

- | Curved part adaptor (minimum sample radius: 20mm)
- | 2mm adaptor head
- | 4mm adaptor head

Dimensions & Weights

- | 150mm x 79mm x 34mm (without head) (H x W x D)
- | 550g
- | Packed weight approx: 1.5kg
- | Packed dimensions: 180mm x 330mm x 280mm (H x W x D)
- | Commodity code: 9027 5000

Order Code A6000-016

Languages Available



INSTRUMENT SPECIFICATION

	20° Gloss		
Range (GU)	0-100	100-2000	
Repeatability	0.2 (GU)	0.2%	
Reproducibility	0.5 (GU)	0.5%	
Resolution (GU)	0.1		
Measurement Area	6.0 x 6.4 (mm)		
Standards*	ISO 2813	ASTM D523	ISO 7668
	ASTM D2457	DIN 67530	JIS Z 8741

	Haze	
Range (Log HU)	0-500	
Repeatability (Log HU)	1	
Reproducibility (Log HU)	10	
Resolution	0.1	
Measurement Area (mm)	6.0 x 6.4	
Standards	ASTM E430	ASTM D4039

	RSPEC	DOI	RIQ
Range	0-2000 GU	0-100	0-100
Repeatability	0.2%	0.2	0.2
Reproducibility	0.5%	0.5	0.5
Resolution	0.1	0.1	0.1
Measurement Area			
Standards	Rhopoint	ASTM E430	Rhopoint

Battery Type	Rechargeable lithium ion
Operation (hours)	17+
Readings per charge	20,000+
Memory	8MB, 2,000 readings
Operating Temperature	15-40°C (60-104°F)
Operating Humidity	Up to 85%, non condensing
Commodity Code	9027 5000

Traceability: NIST Traceable

Repeatability and reproducibility values are quoted for flat surfaces.

Curved surface values are dependent on the shape of the surface and the adaptor type used.

INCLUDED ACCESSORIES

- Instrument with 20° Flex head
- Calibration tile with holder
- USB data cable
- Novo-Gloss Multi Gauge Software
- USB
 - Instruction manual
 - Bluetooth data app
 - Example Excel spreadsheets
 - Instructional videos

ORDER CODES

Rhopoint IQ Flex 20	A6000-016
Adaptor for reduced spot size (4mm)	B6000-501
Adaptor for reduced spot size (2mm)	B6000-502
Curved part adaptor	M6000-504/NEW

EXTRAS

FREE EXTENDED WARRANTY

CALIBRATION AND SERVICE

Fast and economical service via our global network of accredited calibration and service centres.

For detailed information, please visit www.rhopointinstruments.com/support



Certificate no: FS 695372
ISO 9001:2015

LOCAL AGENT



0835-002