



20/60/85°
NOVO-GLOSS
NOW INCLUDES
HAZE
MEASUREMENT

www.rhopointinstruments.com

RHOPOINT **NOVO-GLOSS™**

- | 20/60/85° GLOSSMETER
- | Reflectance Hazemeter to ASTM E430
- | Lightweight and portable
- | Fully featured instrument
- | Bluetooth data transfer

RHOPOINT NOVO-GLOSS™

INTRODUCING THE NOVO-GLOSS TRIGLOSS GLOSS AND HAZEMETER

Gloss measurements are fully compatible with existing Novo-Gloss Lite and Micro-TRI-gloss results and comply to ASTM D523 and ISO 2813

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Haze measurements are made in accordance with ASTM E430

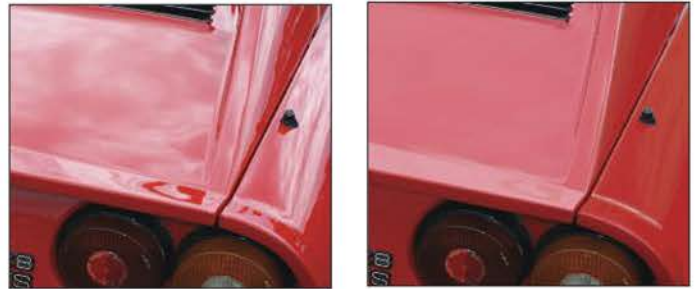
Why measure Gloss?

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 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: highly reflective car body panels, gloss magazine covers or satin black designer furniture.



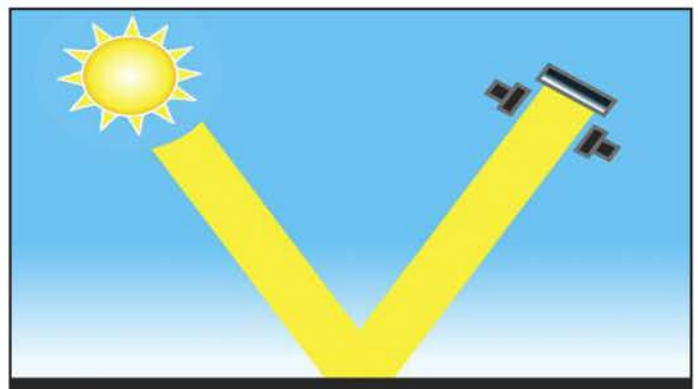
It is important therefore that gloss levels are achieved consistently on every product or across different batches of products.

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 BAM (Germany), NRC (Canada) or NPL (UK).

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.

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.

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.

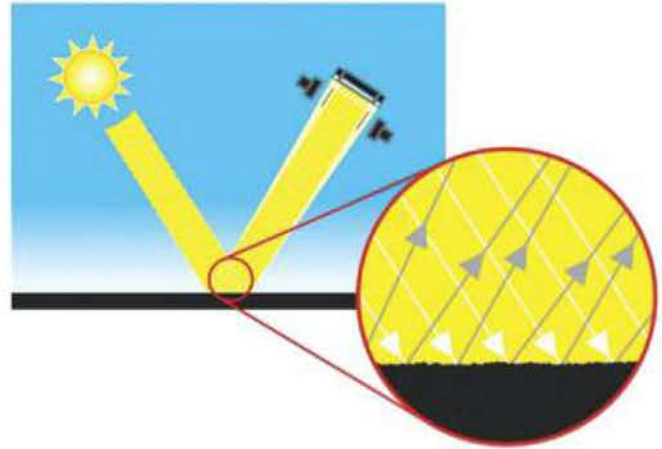
For polished metal surfaces haze is often associated with polishing marks or chemical residue.



Haze

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

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

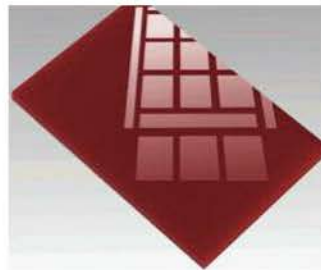


REFLECTANCE HAZE – An optical effect caused by microscopic texture or residue on a surface.

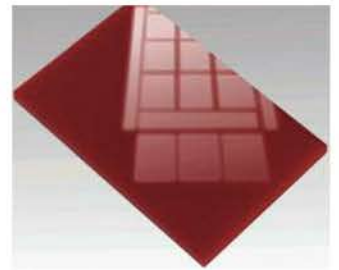
Reflection Haze

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

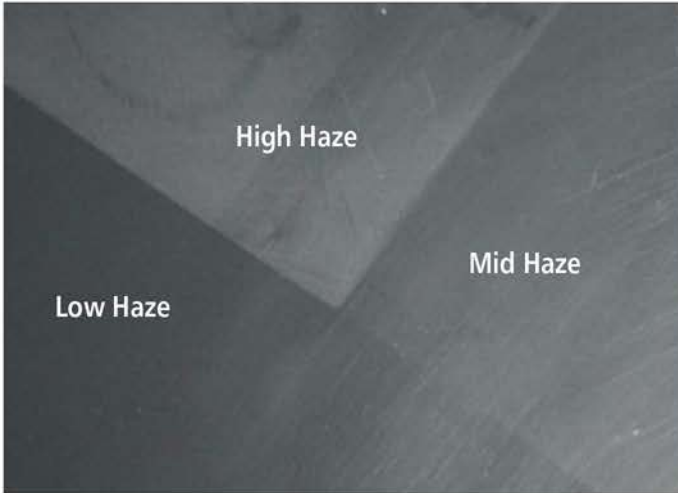
Curing

- 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 Novo-Gloss 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:

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

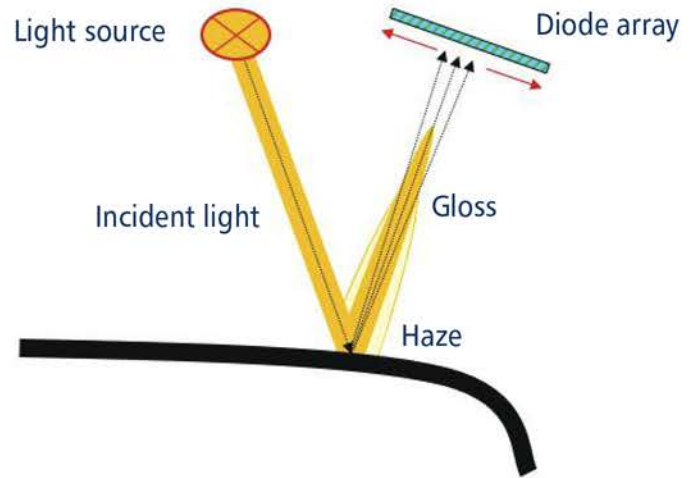
$$\text{Haze} = 100 * \frac{\sum \text{Pixels from } 17^\circ \text{ to } 19^\circ \text{ (sample)} + \sum \text{Pixels from } 21^\circ \text{ to } 23^\circ \text{ (sample)}}{\text{Specular Gloss (Standard)}}$$

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

Auto adjustment on curved surfaces

A major advantage of the Novo-Gloss 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 Novo-Gloss 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.



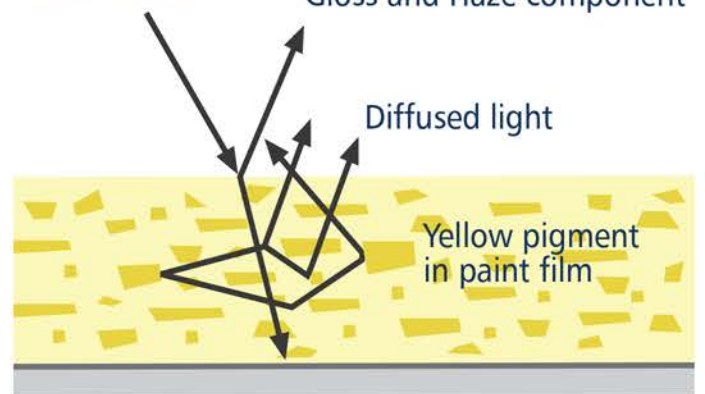
The Novo-Gloss automatically adjusts for non-flat surfaces by sensing the reflected peak and virtually adjusting the position of the sensor.

Diffuse corrected haze measurement with array technology

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.

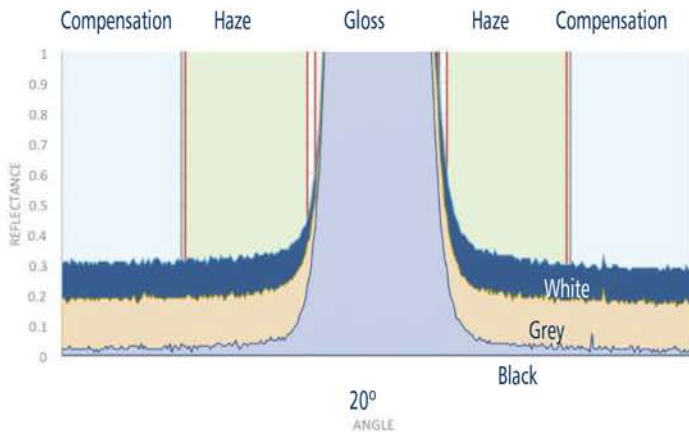
Incident light



The Novo-Gloss 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.

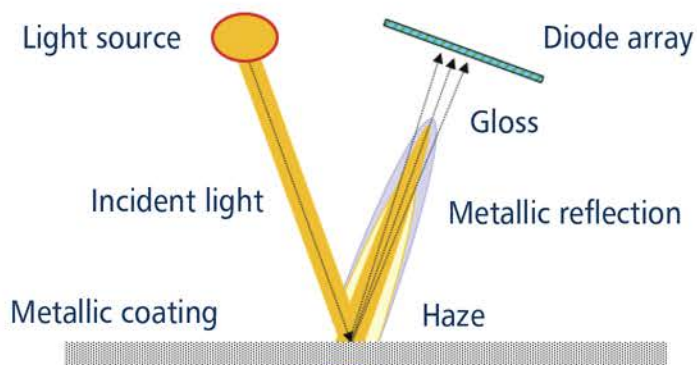
Corrected haze measurement on metallic coatings

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 Novo-Gloss 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 Novo-Gloss 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.

Haze measurements made by instruments which do not conform to ASTM E430 and conform to standards such as ASTM D4039 do NOT feature haze compensation due to the measurement method used.



THE ULTIMATE GLOSSMETER

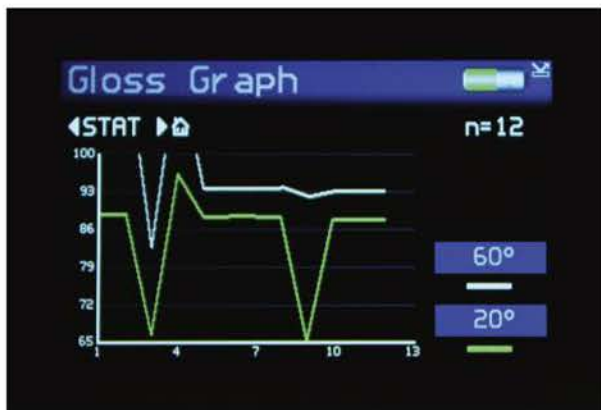
Features

Measurement

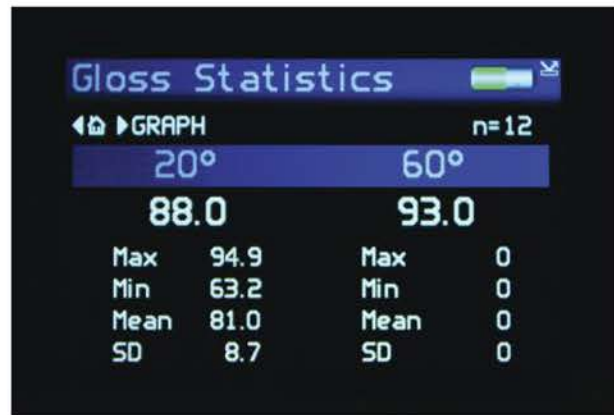
Fast measurement of all parameters. Full on-board statistics with graphical trend analysis and reporting.



Simultaneous measurement of all parameters, results are date and time stamped.



Graphical reporting for quick trend analysis.



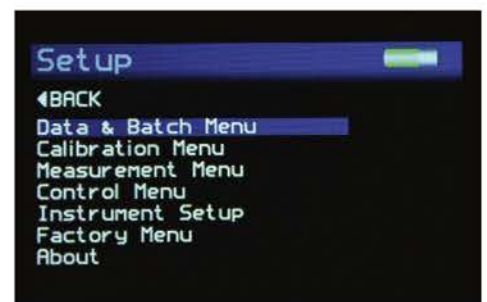
Displays full statistics for the number of readings in the current batch.




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

Easy Batching

User definable batch names and batch sizes for quicker and more efficient reporting.



Rapid data transfer 
Software-free data transfer

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



Direct data input via Bluetooth

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

	1	2	3	4	5	6
DATE	22/02/2013	22/02/2013	22/02/2013	22/02/2013	22/02/2013	22/02/2013
TIME	11:16:24	11:16:42	11:17:17	11:17:37	11:17:58	11:18:19
20°	30.8	32.3	28.4	35.1	34.6	28
60°	70.1	71.8	68.3	73.8	73.2	68.3
85°	88.9	89.1	87.8	90.4	90.4	87.5
Calibrated	22/02/2013	22/02/2013	22/02/2013	22/02/2013	22/02/2013	22/02/2013
Serviced	19/02/2013	19/02/2013	19/02/2013	19/02/2013	19/02/2013	19/02/2013
S/N	2000728	2000728	2000728	2000728	2000728	2000728

Power

10,000+ readings per charge

The instrument is rechargeable via USB/PC or mains.

Specifications

Gloss

20/60/85°* version

20° Improved accuracy and resolution on high gloss & metallic samples (>70GU when measured at 60°)

60° Universal angle – all gloss levels

85° Improved resolution for matt finishes (<10GU when measured at 60°)

Resolution 0.1GU • Repeatability ± 0.2 GU • Reproducibility ± 0.5 GU

Measurement range: 20°: 0-2000GU
60°: 0-1000GU
85°: 0-199GU


Standards: ISO 2813, ISO 7668
ASTM D523, ASTM D2457,
ASTM E430
DIN 67530
JIS 8741
JIS K 5600-4-7


*Verified performance on 20° angle for 20/60/85°


Gloss calibration standard


Traceability: BAM traceable
Uncertainty: 1.1GU


Sample applications


Paints and Coatings 


Printing Ink 

Powder Coating 

Plastics Industry 

Automotive Re-finish 


Furniture 


Metal Polishers 


Polished Stone 

Wood Coatings 

Automotive 

Smartphone, Tablet PC
and Laptop Covers 

Automotive Coatings 

Yacht Manufacturers 

INSTRUMENT SPECIFICATIONS

Operation

- Full colour easy to read screen
- Adjustable brightness
- 6 button touch sensitive interface

Construction

- Integrated calibration holder with in-position detector for error free calibration

Measurement

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

Statistical Analysis

- Max, min, mean, S.D.

Graphical Analysis

- On board trend analysis
- Gloss values

Power

- Rechargeable lithium ion
- 17+ hours operation
- 10,000+ readings per charge

Recharge Time

- Mains powered USB charger < 4 hours

Memory

- 8MB= >2000 readings
- User definable alphanumeric batching

Data Transfer

- Bluetooth
- PC compatible
- USB connection, no software install required

Measurement Area

- 20°: 6.4mm x 6mm
- 60°: 6mm x 12mm
- 85°: 4.4mm x 44mm
- Operating Temperature: 15 - 40 ° C (60 - 104 ° F)
- Humidity: Up to 85%, non condensing

Dimensions & Weight

- 65mm x 140mm x 50mm (H x W x D)
- 530g
- Packed weight: 1.6kg
- Packed dimensions: 180mm x 330mm x 280mm (H x W x D)
- Commodity code: 9027 5000

Languages



INCLUDED ACCESSORIES

- Certified calibration tile with certificate
- USB data cable / charger
- Wrist strap
- Mini CD
 - Instruction manual
 - Bluetooth data app
 - Example Excel spreadsheets
- Instructional videos

EXTRAS

FREE EXTENDED WARRANTY

FREE LIGHT SOURCE WARRANTY

Guaranteed for the life of the instrument

CALIBRATION AND SERVICE

Fast and economic service via our global network of accredited calibration and service centres. Please visit www.rhointinstruments.com/support for detailed information.



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