

Operating Manual



45°, 60° | 20/60/85° Trio 20/60/85° with Haze

RHOPOINT
NOVO-GLOSS™ 

Thank you for purchasing this Rhopoint product.

Please read these instructions carefully before operating this product and retain them for future reference. The images shown in this manual are for illustrative purposes only.

This instruction manual contains important information about the setup and use of the Rhopoint Novo-Gloss. It is therefore essential that the contents be read before powering up and using the instrument.

If this instrument is passed to other users you must ensure that the instruction manual is supplied with the instrument. If you have any questions or require additional information about this product, please contact the Rhopoint Authorised Distributor for your region.

The technology and components used in the device are based on state-of-the art optic and electronics. As part of Rhopoint Instruments commitment to continually improving the technologies used in their products, they reserve the right to change information included in this document without prior notice.

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* Only available on the Novo-Gloss 20/60/85 with Haze

Storage and Handling

- This instrument contains precision optics and electronics. You should avoid knocking or dropping the device as the resulting impact could cause serious damage.
- In some circumstances the optical components in the instrument could become misted due to temperature change. It is recommended that the instrument is not used until it has stabilised to ambient temperature.
- Ensure that the instrument is not exposed to moisture, chemicals or to any corrosive vapours.
- Do not interfere or place any objects inside the measuring aperture as damage to the measuring system could occur.
- The instrument housing and screen are normally resistant to a variety of solvents however it is not possible to guarantee resistance to all chemicals, therefore the surfaces of the instrument should only be cleaned using a soft, moist cloth.
- Prevent exposure of the instrument to direct sunlight for prolonged periods and to continuous humidity and condensation.

Accessories

The instrument is supplied as a standard package complete with all accessories required to calibrate and recharge the unit including:

- Rhopoint Novo-Gloss 45° or
- Rhopoint Novo-Gloss 60° or
- Novo-Gloss Trio or
- Novo-Gloss 20/60/85° with Haze Glossmeter
- Traceable certificate for 45°
- Cleaning cloth for calibration tile
- Traceable instrument certificate
- USB Mains Charger with four selectable mains input connectors (UK / Europe / US)
- USB PC cable
- Quick Start Operating Instructions
- Protective instrument carry case
- Product Warranty Card

Optional items

- Mirror gloss calibration tile including certificate

Functional Overview



| Label No. | Function |
|-----------|---------------------------------|
| 1 | USB Connector |
| 2 | High Resolution Graphic Display |
| 3 | Up/Down/Left/Right Buttons |
| 4 | Operate / Enter Button |
| 5 | Calibration Tile (magnetised) |
| 6 | On / Off Button |

The instrument is controlled by pressing the relevant touch sensitive button. Functionality is dependent on whether the instrument is in menu or operate mode as detailed in the operation sections that follow.

Power

The Novo-Gloss is powered by an integrated high capacity lithium ion cell.

Fully charged the instrument will operate continuously for >17 Hours or >20,000 readings.

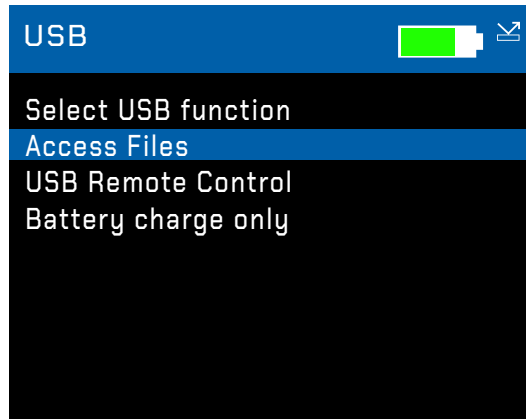
A mains powered USB charger is provided with the unit. This will fully charge the unit when connected to the unit's USB input (6) in up to 9 hours.

Alternatively, the Novo-Gloss can be powered and charged using the USB cable attached to any compatible USB host (e.g. laptop etc.). Please note that charging from a USB host such as a laptop may take longer due to the lower current available.

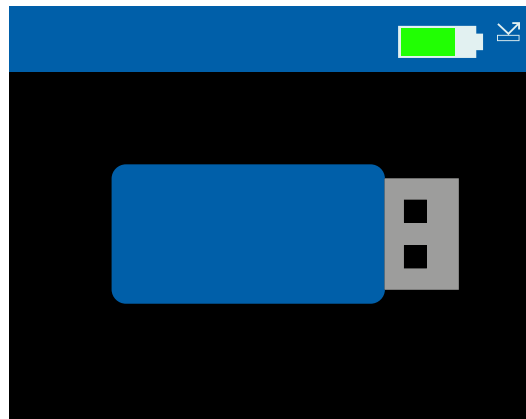
 DO NOT OPERATE THE INSTRUMENT WHILST IT IS CHARGING.

USB Connectivity

Three functions are available when the Novo-Gloss is connected to a computer using the USB cable supplied –



Access Files – Allows access to measurement and configuration files on the instrument. The instrument appears as a USB drive named NG-METER. When selected the display on the instrument shows a USB memory key as shown below –



USB Remote Control - Allows control of the Novo-Gloss remotely by sending ASCII commands from a computer or PLC. In this mode the instrument displays “REMOTE CONTROL ACTIVE” on the main measurement screen.

Battery Charge Only – Allows USB charging of the instrument – all instrument functions are available. Do not operate the instrument whilst it is connected via USB and/ or charging.

Switching the instrument on

To switch the unit on, press the **On / Off** button located above and to the right of the USB socket.

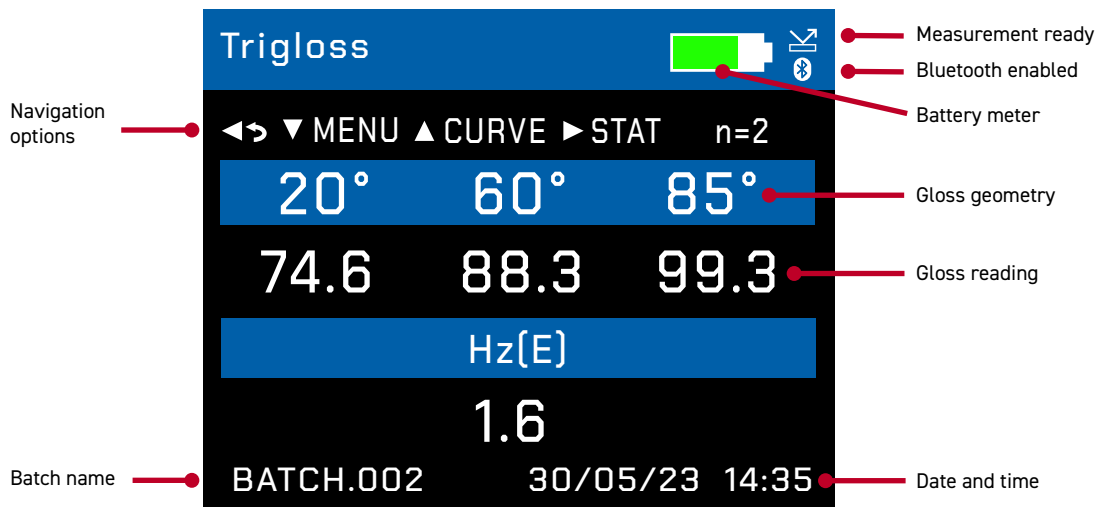


The instrument will display the Rhopoint logo and then the Home screen displaying measurement parameters according to the instruments default settings or those previously configured.

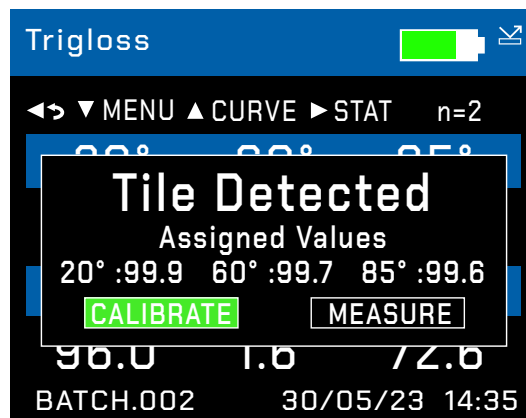
Operation

With the unit switched on and initialised the instrument will display the Home screen as shown below.

Measurement screen and options vary depending on instrument type.



In this mode, measurements can be made by simply pressing the **operate** button (4) on the instrument's keypad. If the Auto Calibration option is set to ON in the settings menu (detailed later in the Instrument Settings section of this manual) a dialogue box will appear when the **operate** button is pressed as shown below:



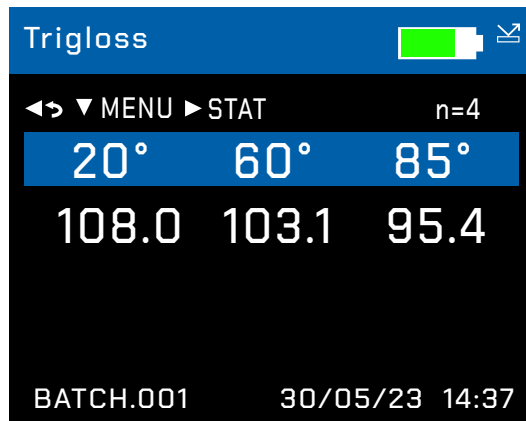
Two options are available: either to “Calibrate” the instrument on the calibration tile before making the measurement or to “Measure” without performing a calibration.

Using the **Left / Right** (3) and **Enter** (4) buttons on the keypad the required option can be selected.

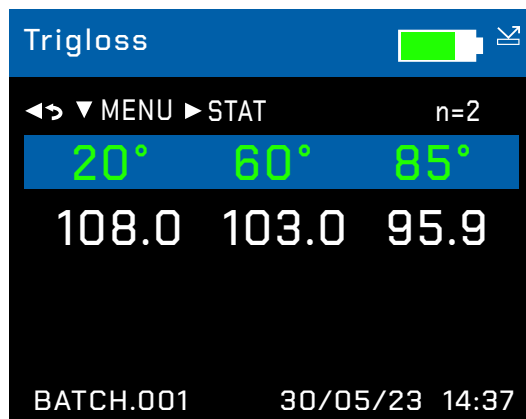
Selecting “Calibrate” the instrument will perform a calibration and display a confirmation dialogue box when completed. Selecting the “Confirm” option will save the calibration information to the instrument’s memory, which will also be confirmed by the calibration tile Gloss and IQ* readings appearing on the instruments display. Alternatively, if “Cancel” is selected the display will return to the Home screen.

Selecting “Measure” the instrument will perform a measurement and after 3 -4 seconds display the results.

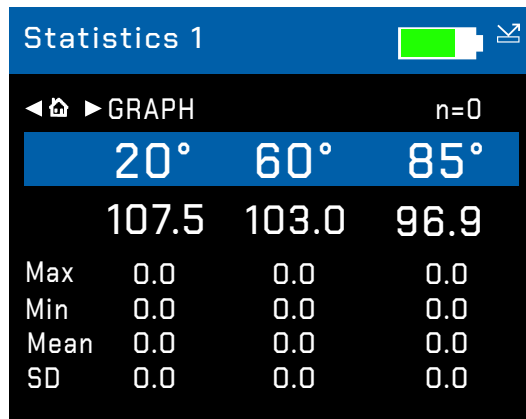
*The IQ screen is only available on the Novo-Gloss 20/60/85 with Haze.



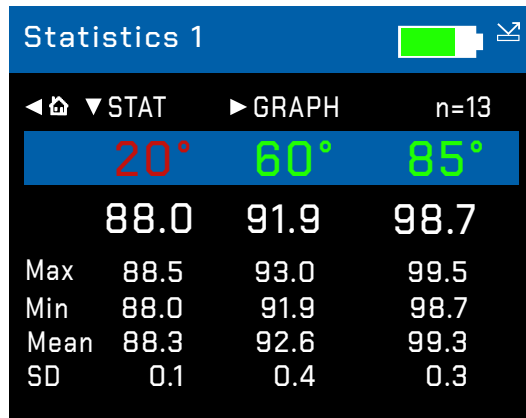
With the pass / fail feature enabled, the Novo-Gloss will compare each measurement angle to user defined tolerances. If the gloss reading is within specification, the angle header will be displayed in Green. If the reading falls outside the tolerances the header is marked in Red.



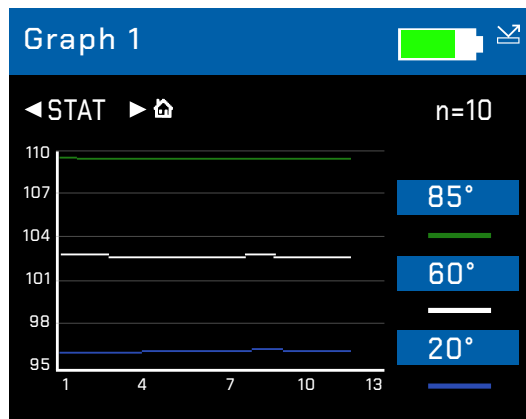
Press the **Right** button in the Home screen to access the gloss statistics screen for the current batch for all three angles. Measurements can be taken whilst in this screen and the statistics will be updated.



If the Pass / Fail feature is enabled, the colour of the angle header indicates if the last reading is within the user defined tolerances.



Press the **Right** button in the gloss statistics screen to access the gloss graph screen, which gives a graphical representation of the statistics data.

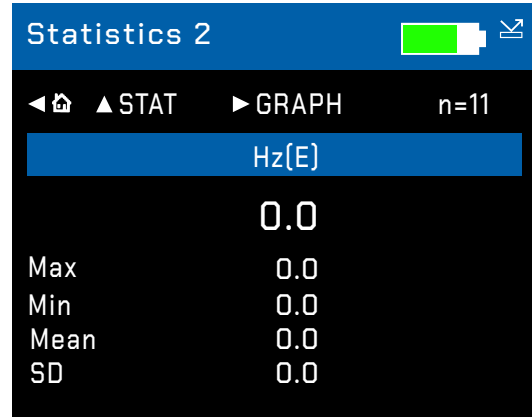
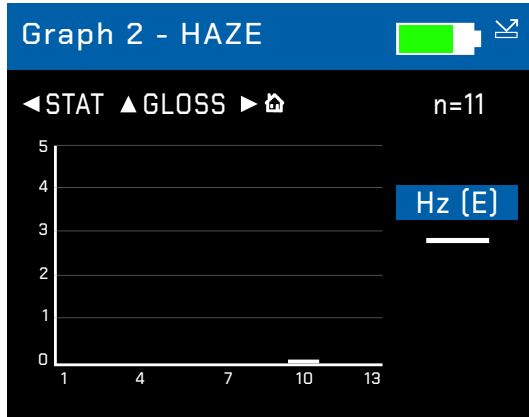


Measurements can be taken whilst in this screen and the graph will be updated after each reading.

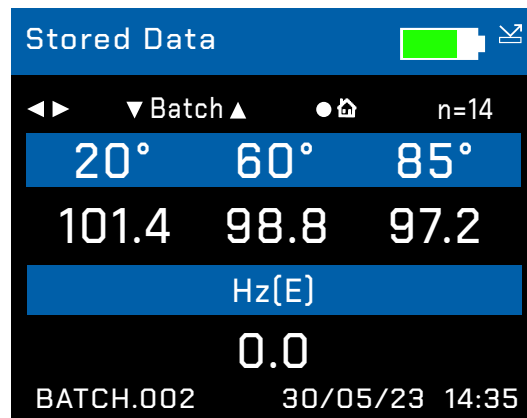
Press the **Left** button to return to the statistics screen.

Press the **Right** button to return to the Home screen.

*The Novo-Gloss 20/60/85 with Haze has additional screens available to display haze graph and statistics. Press the **Up/Down** buttons to switch between Gloss and Haze screens.



In the Home screen press the **Left** button to display the Stored Data screen.



When Memory is set to ON (as detailed later in the Menu Screen section of this manual) measurements can be recalled and displayed from any batch stored in the Novo-Gloss memory.

Press the **Left / Right** buttons to review the measurement data.

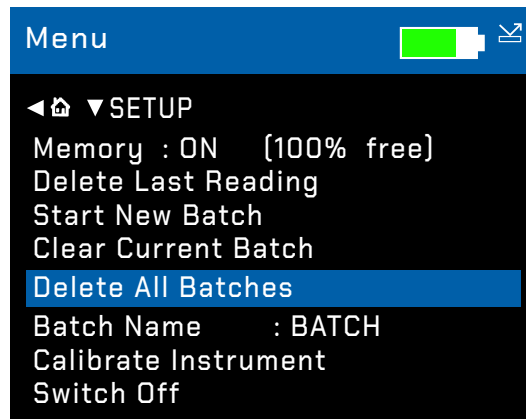
Press the **Up / Down** buttons to select each batch.

At the end of each batch the mean values for the batch are displayed.

Press the **Enter / Operate** button to return to the Home screen.

Menu Screen

The Menu Screen is used for quick access to frequently used options. Press the **Up / Down** buttons to navigate through the options, press the **Enter** button to select the option required.



Selectable settings in the menu screen are: -

Memory – Set to ON - enables storage and batching of measurement results. The amount of available storage memory is also displayed.
Set to OFF - disables result storage.

With Memory ON:

Delete Last Reading – Delete last measurement, no. of measurements and statistics data updated to previous values.

Start New Batch – Start new batch of readings, Batch name is incremented by 1.

Clear Current Batch – Delete entire batch of measurements for current batch.

Delete All Batches – Delete all batches and measurements stored.

Batch Name – Default name is BATCH, a maximum of 8 user defined batch names can be used as detailed in the “Batching Options” section.

Calibrate Instrument – Perform a calibration of the instrument as detailed under “Operation”.

Switch Off – Turn off the instrument.

Press the **Left** button to returns to the Home screen.

Press the **Right** button to access the Setup screen.

Batching Options

The batching feature allows the user to group measurements together in batches. Each batch has associated statistics; the data for each batch can be accessed by connecting the instrument to a PC.

The current batch name is displayed on the Home screen in the bottom left corner, the sample number within that batch is shown in the top right of the screen indicated with n=(sample number).

A new batch is started using the Start New Batch option in either the Menu screen or the Data menu, note that the batch name will increment as will the 'n' indicator.

The current batch can be cleared in either the Menu screen or the Data Menu, the batch name will remain the same but the 'n' indicator will reset to zero.

Auto batch size is user defined using the Auto Batch option in the Data Menu. When the number of readings in the current batch reach the number set by the user the instrument will automatically increment the batch name and set the 'n' indicator to zero.

Viewing Batch Data

To access the stored batch information, connect the instrument to a PC using the USB data cable supplied.

A new device name "IQ-METER" can be viewed and accessed via "MY COMPUTER", in this device open the DATA folder.

This folder contains subfolders which contain the data for each individual saved batch.

Each reading is saved as an individual comma separated value (.csv) that contains Gloss, Haze, DOI/RIQ, RSpec, Time and Date of Reading, Serial Number and Full Goniophotometric data for all 512 diode elements.

Each reading also contains the statistics for the batch up to and including that reading.

To access the STATISTICS for the whole batch, the last reading in the batch should be examined.

User Defined Batch Names

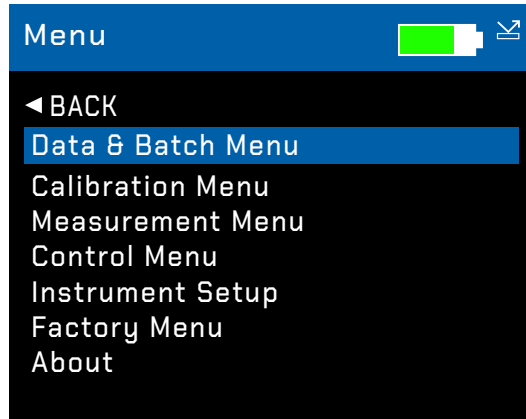
Batch names are user definable. With the instrument connected to a PC, open the folder named "CONFIG". Within this folder there is a document named "batches". This is a .csv file that can be opened in Notepad, Excel or Wordpad.

User defined names should be saved in this document, each name listed on a separate line. Ensure that the final line is terminated with a carriage return.

The format of these names should only contain letters. No numbers, spaces or other characters can be used.

Once completed, save the file and then switch the instrument off and on again to initialize the new batch names.

Setup Screen

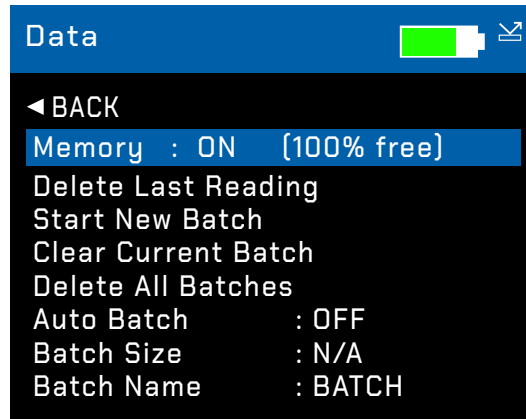


The Setup Screen is used to customise the instrument to the user's preference. Press the **Up / Down** buttons to navigate through the options, press the **Enter** button to select the option required.

- Data and Batch Menu - Batch / Data options (See Data & Batch Menu Screen)
- Calibration Menu - Calibration options (See Calibration Menu Screen)
- Measurement Menu - Geometry setup (See Measurement Menu Screen)
- Control Menu - Bluetooth setup (See Control Menu Screen)
- Instrument Setup - Language, Date / Time and Power options (Setup Menu Screen)
- Factory Menu - Pin locked menu options for Rhopoint authorised service centres
- About Menu - Information relating to the instrument's firmware, serial number and last date of Factory Calibration

Press the **Left** button to return to the Home screen.

Data & Batch Screen



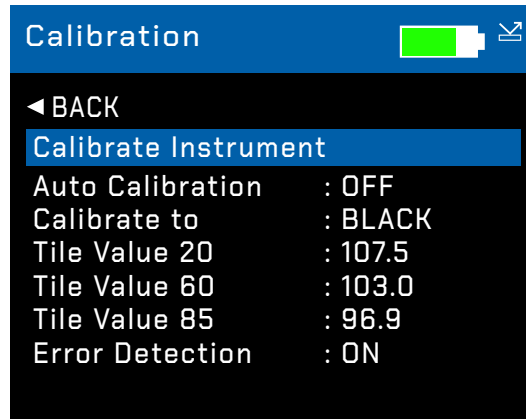
The Data & Batch Screen is similar in functionality to that of the menu screen but also allows the selection and setting of the Auto Batch size.

By selecting Auto Batch to ON the batch size can be selected between 1 – 999. Press the **Left** and **Right** buttons to select the relevant digit and the **Up / Down** buttons to increment / decrement the value. Press the **Enter** button to save the batch size.

If Batch names have been user defined, as detailed under Batching Options, selection of the Batch Name required is achieved by repeatedly pressing the **Enter** button with Batch Name selected.

Press the **Left** button to return to the Home screen.

Calibration Screen

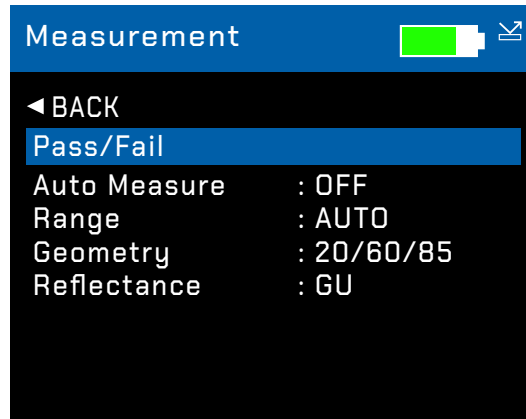


The Calibration Screen is used to setup the instrument calibration to the user's preference. Press the **Up / Down** buttons to navigate through the options, press the **Enter** button to select the option required.

Selectable settings in the Calibration screen are:

- Calibrate Instrument - Performs an instant calibration of the instrument; a dialogue box being displayed upon completion to either "Cancel" or "Confirm".
- Auto Calibration - Set to ON, a dialogue box appears each time a measurement is taken as detailed under Operation.
Set to OFF, the dialogue box is disabled; measurements are made.
- Calibrate to - Set to Black - a traceable gloss tile is used as the calibration standard
Set to Mirror - a traceable mirror tile is used as the calibration standard
- Tile Value 20, 45, 60, 85 - Set the calibration values for either standard being used for calibration. Press the **Enter** button to select the value. Press the **Left / Right** buttons to select the relevant digit and the **Up / Down** buttons increment / decrement the value. Press the **Enter** button again to save the value.
- Error Detection - The instrument detects the condition of the calibration standard being used.
Set to OFF - Values are still checked against the stored reference but no other error checking is carried out.
Set to CAL - A check is made to see if an appropriate hardware channel is wildly different to what it should be, indicating that the calibration is being attempted on the wrong tile type.
Set to Hz - A check is carried out on the haze value, if this is higher than expected the tile could be dirty.
Set to CAL + Hz - A combination of the two above.
- Haze Tolerance - Set the tolerance for the standard being used for calibration.

Measurement Screen



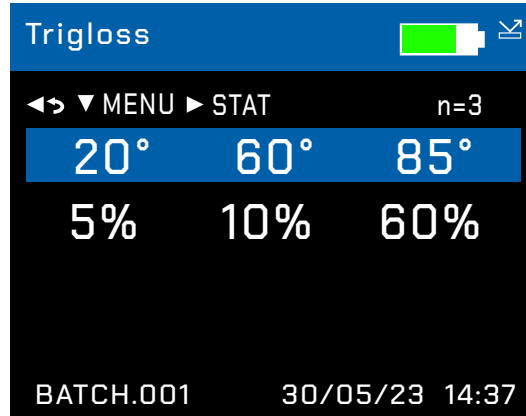
The Measurement Screen is used to configure the instruments measurement parameters to the user's preference. Press the **Up / Down** buttons to navigate through the options, press the **Enter** button to select the option required. Press the **Right** button to enter the IQ Screen*

Selectable settings in the Measurement screen are: -

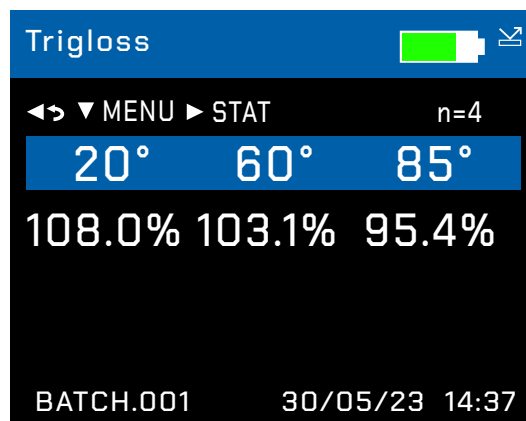
- Pass/Fail - Enters the Pass/Fail set up screen.
- Auto Measure - Enables or disables automatic measurement mode, used for monitoring surfaces for changes over a period of time. Press the **Enter** button to select the required measurement frequency of either 2, 5 or 10 seconds. When auto measure mode is activated a dialogue box is displayed after the **Enter** button is pressed and before the beginning of the measurement sequence indicating that it is activated. To stop auto measure simply press the **Enter** button once again at any time during the sequence.
- Range - Selects gloss measuring range to:
 - Auto - Full range
 - Black - Standard gloss scale
 - Mirror - Extended scale for highly reflective materials, polished metals, requires calibration using Mirror standard.
- Geometry - Displays the measurement angle either:
 - 45 Single angle mode
 - 60 Single angle mode
 - 20/60 Dual mode
 - 20/60/85 Tri mode (Configurable as 20, 60, 85 individually, 20/60 or 60/85 dual or 20/60/85)
- Reflectance - Selects the measurement unit to be displayed for each angle % - display percentage reflectance, 100% reflectance = 2000GU@20 degrees, 1000GU@45 and 60 degrees, 160GU@85 degrees.

GU - display Gloss Units

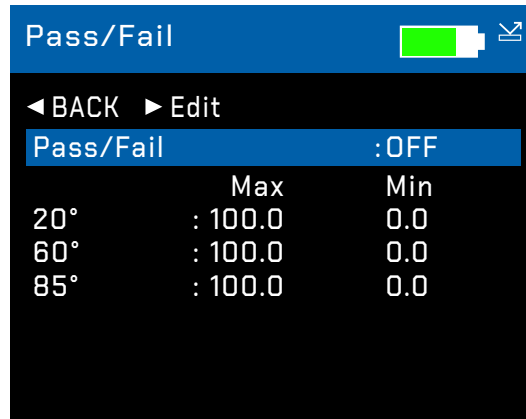
With Reflectance set to % measurement results for each angle are displayed as -



With Reflectance set to GU measurement results for each angle are displayed as -



Pass/Fail Setup Screen



The Pass / Fail Setup screen is used to enable/disable on screen pass/fail indication and set measurement criteria.

The **Down** key should be used to navigate to the Pass / Fail option and the center button pressed to toggle the feature on and off.

Press the **Right** button to edit the Pass / Fail limits.

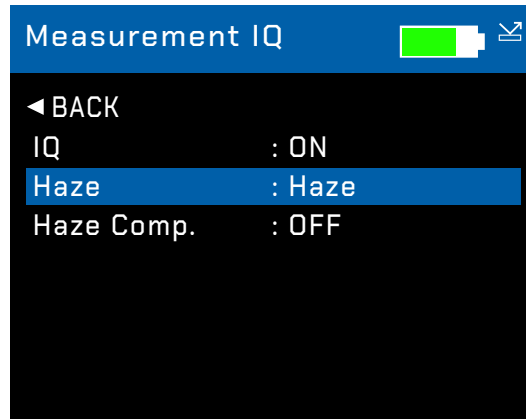
Once the Pass / Fail feature is enabled, any measurement which falls between the max and min values will be considered a pass and its header text will be coloured Green.

Readings above the max value or below min value will be deemed a fail and header text will be coloured Red.

Saved data and data transmitted by Bluetooth will also contain a pass/fail field.

Selecting the Done option will complete this process.

IQ Screen*



The IQ screen is used to configure the instruments IQ settings.

IQ - Selects IQ information to be either displayed (ON) or not displayed (OFF) on screen

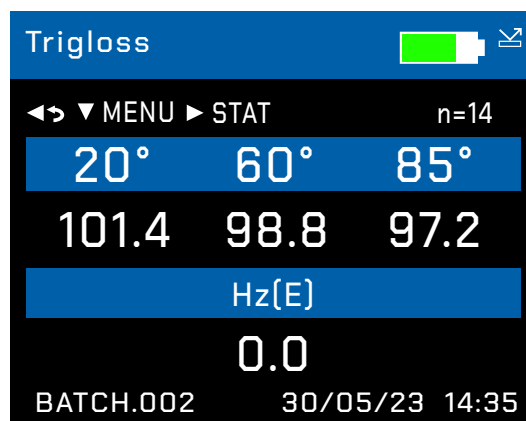
Haze - Selects Haze measurement according to test method ASTM E430, test method ASTM D4039 or logHaze (a more sensitive measurement). ASTM D4039 is only suitable for non-metallic samples having a gloss value of greater than 70GU at 60 degrees (values below this are still calculated but the haze value is displayed in red).

Further details of Haze test methods and logHaze can be found in the Appearance Theory section of this manual.

Haze Compensation - Selects either ON or OFF. Haze compensation is not available when ASTM D4039 is selected. Further details of Haze Compensation can be found in the Appearance Theory section of this manual.

Press the **Left** button to return to the Home screen.

With IQ settings set to ON Haze measurements are displayed in addition to Gloss as shown below:

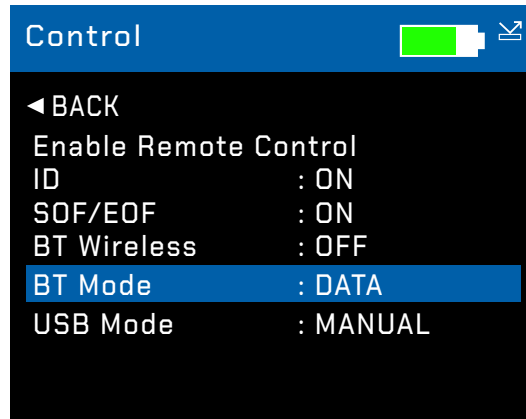


With ASTM E430 selected an (E) identifier will be displayed next to the Hz parameter.

With ASTM D4039 selected a (D) identifier will be displayed next to the Hz parameter

*The IQ screen is only available on the Novo-Gloss 20/60/85 with Haze.

Control Screen



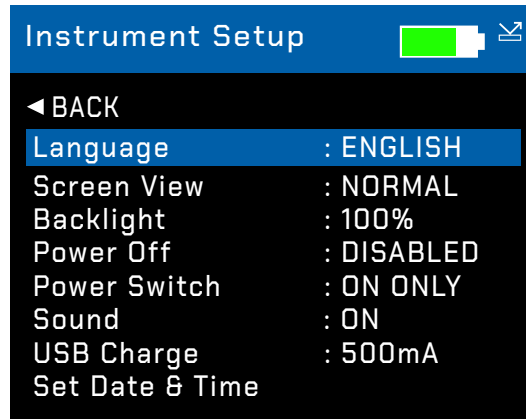
The Control Screen is used to configure the instruments Bluetooth parameters to the user's preference. Press the **Up / Down** buttons to navigate through the options, press the **Enter** button to select the option required.

Settings in the Control screen are:

- ID – Measurement definition header
- SOF/EOF – Start / End of file markers for use in analysis software
- BT Wireless - Enables or disables Bluetooth
- BT Mode – Set the functionality of Bluetooth –
 - RC (Remote Control) – Operate and receive data via Bluetooth
 - Data – Only receive data via Bluetooth
- USB Mode – Set the functionality of the USB connection when connected to a PC –
 - Charge – Charge the instrument via USB (note the instrument can be operated during this time but cannot be used to make measurements)
 - Manual – Allow the functionality to be selected on the instrument each time a connection is made
 - RC – Remotely control the instrument via USB to make measurements and transfer data.
 - Data – Data only mode.

Press the **Left** button to return to the Home screen.

Instrument Setup Screen

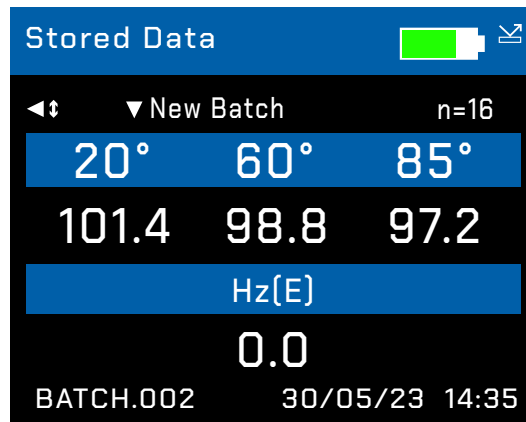


The Instrument Setup screen is used to configure the instruments basic operating environment to the user's preference. Press the **Up / Down** buttons to navigate through the options, press the **Enter** button to select the option required.

Selectable settings in the Instrument Setup screen are:-

- Language – Set instrument language to English (default), Spanish, Italian, French, German, Chinese, Japanese.
- Screen View – Set the orientation of the screen as NORMAL, or INVERTED.
- Backlight – Set screen intensity to either 20%, 40%, 60%, 80% or 100% brightness.
- Power Off – Set instrument to automatically power off after either 30, 60, 90 or 120 seconds of inactivity or DISABLE this feature.
- Power Switch – Set Power **On/Off** button for different functions when pressed –
 - ON/ONLY - Turn the instrument on only.
 - ON & OFF - Turn the instrument on and off.
 - ON (Fn) - When **power** button is held new batches can be created in the main measurement screen by pressing the **Down** button.
 - When **power** button is held the screen can be rotated 180 degrees by pressing the **Up** button.
 - ON (●) - Make a measurement when the **power** button is pressed.

In the Home screen, press and hold the **On / Off** button, the display will change as shown below-



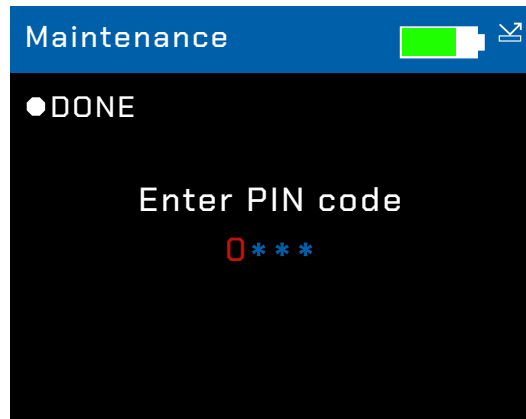
Press the **Up** button to rotate the screen. Only one rotation is possible each time the **On / Off** button is pressed.

Press the **Down** button to start a new batch, this action is either confirmed or cancelled by selecting the required box when prompted using the **Left / Right** buttons and pressing the **Enter** button.

- Sound - Enable or disable button press sound.
- USB Charge - Set the USB charge current to either 500mA or 100/500mA.
- Set Date & Time - Set the date and time on the instrument. Press the **Down** button to set time. Press the **Left / Right** buttons to select the date or time and the **Up / Down** buttons to increment / decrement the value. Press the **Enter** button again to save the value.

Press the **Left** button to return to the Home screen.

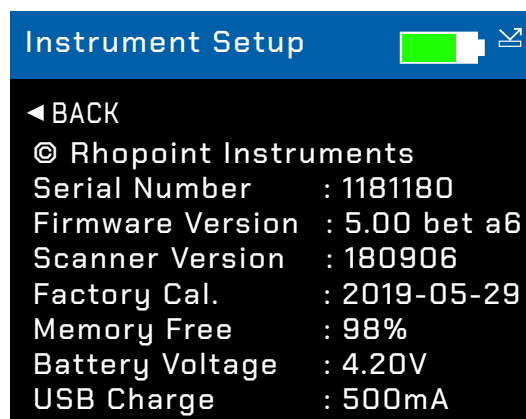
Maintenance Screen



The Maintenance screen is used by Rhopoint Approved Service Centres. It is PIN locked to prevent unauthorised access. There are no user configurable settings available in this menu.

Press the **Enter** button to return to the Home screen

About Screen



The About screen is for information only.

It provides information relating to the instrument's software, the instrument serial number and last date of Factory Calibration. It also shows the amount of free memory available and battery power status.

Bluetooth Communication and Pairing

The Novo-Gloss has a **Bluetooth** function that allows readings to be instantly transmitted to a compatible PC.

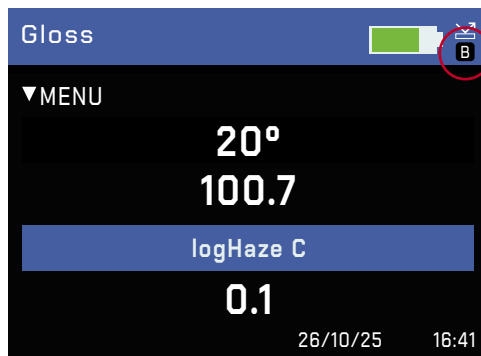
20/60/85° Gloss, Log Haze, DOI/RIQ, RSPEC, instrument serial number and service/calibration data can be instantly accessed by many PC applications including Excel, Word, Wordpad, OpenOffice or SPC packages.

Pairing Procedure

Switch on the Rhopoint Novo Gloss.

The **Bluetooth icon** must be visible to allow pairing.

The gloss meter can now be connected to the **App** for easy transfer of readings.



Connectivity to Rhopoint Quick Report

The Rhopoint Novo-Gloss Gloss Meter can be connected to the **Rhopoint Quick Report App**.

This will quickly and easily create a professional detailed report:

The App is available on IOS, Chrome and Android.

Please refer to the App Manual for more information on using Quick Report.



Rhopoint Detailing
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Polishing@rhopointdetailing.com
01424 123456

REPORT

General information

Report Name:
39 - SH1 NEY - Panels - Mr Detail



Report Date:
25/01/2024, 12:51:37

Serial number:
1005758 Detallometer
Coating Thickness Gauge



Report

Part Name: Car LH side

| Part | Description | Car LH side |
|---|-------------|--|
|  | |  |

| Device | # | DOI | Gloss 20° | Haze | LogHaze | RIQ | Rspec | Comment |
|--------------|---|------|-----------|------|---------|------|-------|----------------------------|
| Detallometer | 1 | 96.6 | 100.3 | 0.2 | 5.7 | | 96.8 | Img 1, low thickness, dent |
| Detallometer | 2 | 96.9 | 100.0 | 0.2 | 5.5 | 91.7 | 98.1 | --- |
| Detallometer | 3 | 96.9 | 100.0 | 0.2 | 5.5 | 91.7 | 98.1 | --- |
| Detallometer | 4 | 96.9 | 99.9 | 0.2 | 5.7 | 91.7 | 98.0 | --- |

| | DOI | Gloss 20° | Haze | LogHaze | Rspec | RIQ |
|----------|------|-----------|------|---------|-------|------|
| #1 Min | 96.6 | 100.3 | 0.2 | 5.7 | 96.8 | 0.0 |
| #1 Max | 96.6 | 100.3 | 0.2 | 5.7 | 96.8 | 0.0 |
| #1 Av. | 96.6 | 100.3 | 0.2 | 5.7 | 96.8 | 0.0 |
| #2 Min | 96.9 | 100.0 | 0.2 | 5.5 | 98.1 | 91.7 |
| #2 Max | 96.9 | 100.0 | 0.2 | 5.5 | 98.1 | 91.7 |
| #2 Av. | 96.9 | 100.0 | 0.2 | 5.5 | 98.1 | 91.7 |
| #3 Min | 96.9 | 100.0 | 0.2 | 5.5 | 98.1 | 91.7 |
| #3 Max | 96.9 | 100.0 | 0.2 | 5.5 | 98.1 | 91.7 |
| #3 Av. | 96.9 | 100.0 | 0.2 | 5.5 | 98.1 | 91.7 |
| #4 Min | 96.9 | 99.9 | 0.2 | 5.7 | 98.0 | 91.7 |
| #4 Max | 96.9 | 99.9 | 0.2 | 5.7 | 98.0 | 91.7 |
| #4 Av. | 96.9 | 99.9 | 0.2 | 5.7 | 98.0 | 91.7 |
| Part Min | 96.6 | 99.9 | 0.2 | 5.5 | 96.8 | 91.7 |
| Part Max | 96.9 | 100.3 | 0.2 | 5.7 | 98.1 | 91.7 |
| Part Av. | 96.8 | 100.0 | 0.2 | 5.6 | 97.8 | 91.7 |

| Device | # | Thickness (µm) | Comment |
|-------------------------|---|----------------|---------|
| Coating Thickness Gauge | 1 | 152.0 µm | --- |
| Coating Thickness Gauge | 2 | 200.0 µm | --- |
| Coating Thickness Gauge | 3 | 214 µm | --- |
| Coating Thickness Gauge | 4 | 214 µm | --- |

| | Thickness (µm) |
|--------|----------------|
| #1 Min | 152.0 |



Appearance Theory

Why is reflected appearance important?

A crucial factor in assessing the appearance of any manufactured product is the “glossiness” of its finish.

Gloss finishes are often used to make products visually appealing. Highly reflective, extremely smooth finishes are used to enhance the aesthetics of cars, luxury yachts and high-end consumer electronics. Matt finishes are used for contrast or on furniture and architectural features.

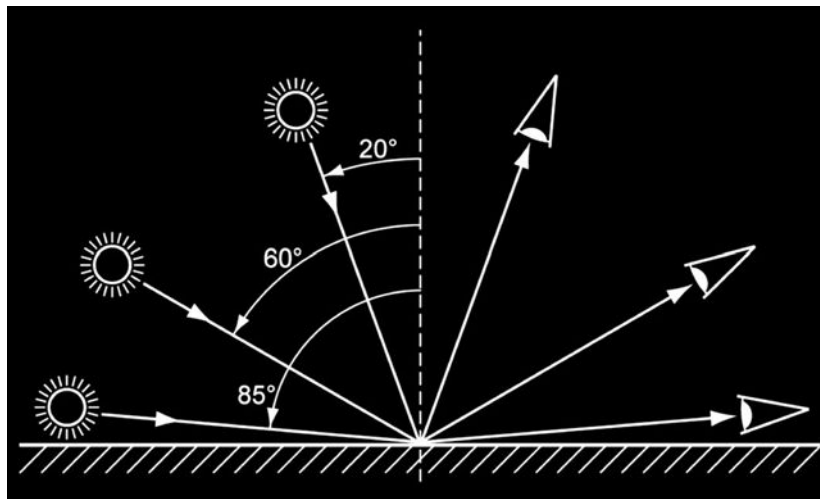
Gloss

Gloss is the visual sensation associated with the brightness of direct light reflected in a surface. Surfaces with high reflectance are determined as glossy; less reflective surfaces are semi-gloss or matt.

Glossmeters quantify this effect by measuring light reflection from a sample at defined angles.

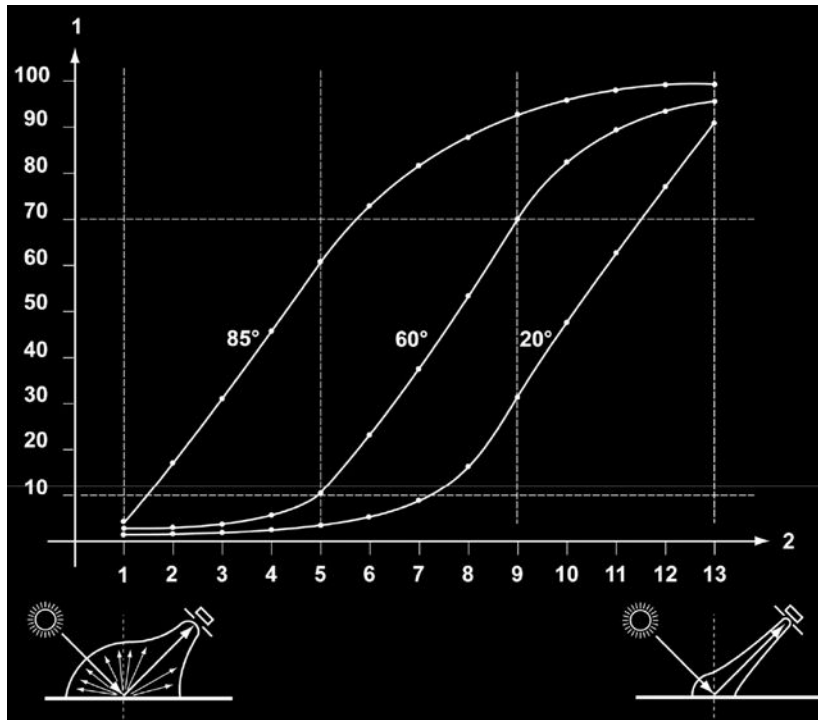
The Gloss Unit (GU) is defined in international standards including ISO 2813 and ASTM D523. It is determined by the amount of reflected light from a glass standard of known refractive index.

Calibration tiles supplied with Rhopoint instruments are traceable to master glass standards held at NIST (USA).



The measurement angles most commonly used for gloss are 20°, 60° and 85°.

- The most appropriate angle should be selected dependent on the glossiness of the sample surface.
- Using the correct measurement geometry increases resolution and improves the correlation of results with human perception of quality.



Graph showing 13 painted panels visually assessed and ranked for gloss, the measured values show 85° has improved resolution for low gloss, 60° is best suited for mid gloss and 20° should be used for high gloss.

To determine the correct measurement angle the surface should be assessed with the 60° geometry-

- Matt surfaces which measure below 10 GU @ 60° should be re-measured with the 85° angle.
- High gloss surfaces which measure above 70 GU @ 60° should be assessed using the 20° angle.
- The 60° angle is suitable for use on mid gloss samples 10-70 GU.

% Reflectance

Materials having a high refractive index such as clear plastics and varnishes can typically have measurement values that exceed 100GU due to multiple reflections occurring within the material. Highly reflective metals can also produce gloss values up to 2000GU. In these cases, it is common not to report values in GU but to express them in terms of percentage Reflectance.

% Reflectance therefore compares the amount of light energy transmitted and received by a gloss meter and expresses the value as a percentage of the measurement angle full range.

Whilst the Gloss (GU) scale is linear, each measurement angle has a different upper range; 20°: 0 – 2000GU, 60°: 0 – 1000GU, 85°: 0 – 199GU.

The measurement mode is a simple conversion of gloss value to percentage reflectance.

20 degree - 2000GU = 100% reflectance

60 degree - 1000GU = 100% reflectance

85 degree - 199GU = 100% reflectance

So, 20 degree - 1000GU = 50% reflectance, 500GU =25% etc.

When the Novo-Gloss 20/60/85 with Haze is calibrated in this mode it will calibrate to the GU value but will still display % reflectance.

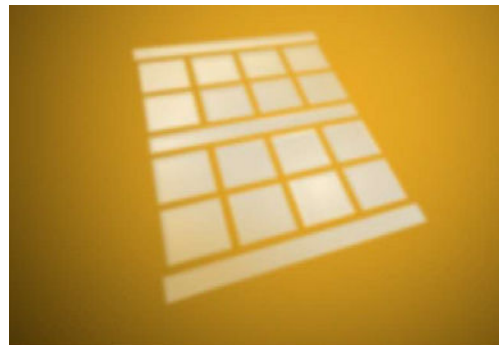
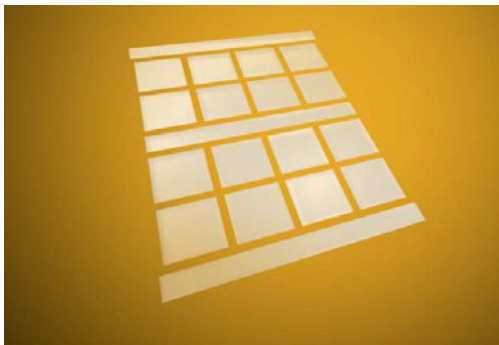
Haze*

Haze describes the milky halo or bloom seen on the surface of high gloss surfaces.

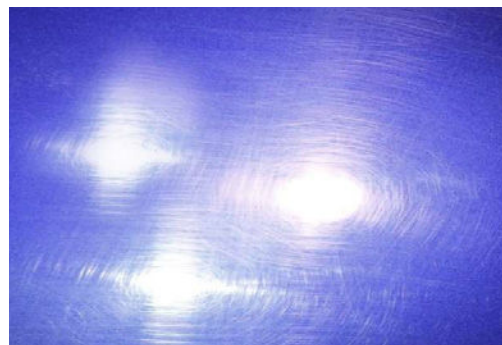
Surface haze can be problematic in most coating applications including automotive manufacture, powder coatings and other high gloss coatings. It can be attributed to a number of causes including incompatible materials in a formulation, poor dispersion and problems encountered during drying/curing/stoving.

Coatings without haze can be seen to have a deep reflection and have high reflected contrast. Those with haze exhibit a slight "milky" finish which can be seen over the highly glossy surface.

Haze is caused by microscopic surface texture which diffuses light adjacent to the main component of the reflected light.



When viewing the reflection of a strong light source in a surface with high haze the image "blooms" and has a bright halo around it.



Haze is an important measure for highly polished metals and is often associated with polishing marks and machining direction.

Gloss-haze meters are traditionally used to measure this parameter and use a standard glossmeter design with additional light stops and diodes to measure the haze component 2° either side of the specular component.

*This is option only available on the Novo-Gloss 20/60/85 with Haze

Measuring Haze with the Novo-Gloss 20/60/85 with Haze

Gloss Haze values can be calculated using two ASTM test methods – ASTM E430 – using defined angular tolerances around the 20 degree specular angle

ASTM D4039 – using the calculated difference between measured gloss values at 20 and 60 degrees ($H = G_{60} - G_{20}$). This method is only suitable for non-metallic samples having a gloss value of greater than 70GU at 60 degrees (values below this are still calculated but the haze value is displayed in red).

The instrument can display the natural haze value (HU) or Log Haze Value (HULOG).

When measuring haze values, higher numbers indicate a lower quality surface.

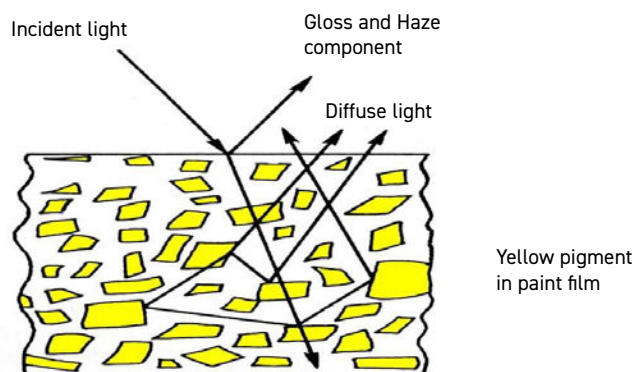
A high gloss surface with zero haze has a deep reflection image with high contrast.

Log Haze Values are commonly quoted for paints and coatings as this scale has better corroboration with human perception of surface quality.

Haze Compensation

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.



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.

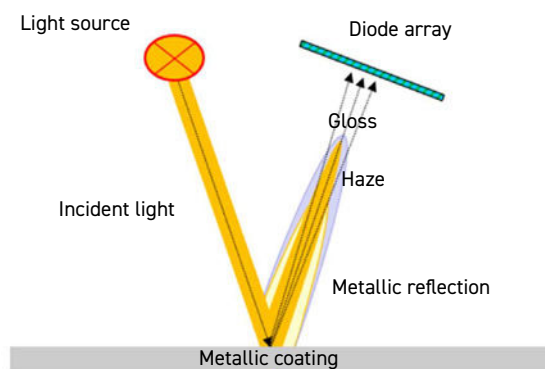
*This is option only available on the Novo-Gloss 20/60/85 with Haze

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 measured independent of their colour.

Conventional gloss-haze meters do not work correctly on metallic coatings as metallic flake within the coating reflects the light directionally around the specular angle. As little or no metallic reflection is present at the angle at which the luminosity is measured, metallic coatings and speciality pigments have an unexpectedly high haze reading.



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

An advantage of the Novo-Gloss is that unlike a conventional instrument, compensation is calculated using a region adjacent to the haze angle. This techniques gives compatible readings on solid colours but also compensates for directional reflection from metallic coatings and speciality pigments Haze correction is only possible using haze measurement according to test method ASTM E430, therefore when measuring bright or highly diffuse colours (metallics) a difference will be noted between the two test methods. Measurements taken using ASTM D4039 will be reported higher than ASTM E430 due to the diffusion from the surface.

*This is option only available on the Novo-Gloss 20/60/85 with Haze

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