

GlossTools

Instruction Manual

As from software version 1.0.0036
for the following glossmeter series:

ZGM 1110

ZGM 1120

ZGM 1130



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Exclusion of liability

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The features described in this instruction manual represent the complete technology of this instrument. These features are either included in the standard delivery or available as options at additional costs.

Illustrations, descriptions as well as the technical specifications conform to the instruction manual at hand at the time of publishing or printing. However, Zehntner GmbH Testing Instruments policy is one of continuous product development. All changes resulting from technical progress, modified construction or similar are reserved without obligation for Zehntner to update.


Some of the images shown in this instruction manual maybe of a pre-production model and/or are computer generated; therefore the design/features on the final version of this instrument may differ in various aspects.


The instruction manual has been drafted with the utmost care. Nevertheless, errors cannot be entirely excluded. The manufacturer will not be liable for errors in this instruction manual nor for damages resulting from any errors.

The manufacturer will be grateful at any time for suggestions, proposals for improvement and indications of errors.


1 Safety information


1.1 Symbols used


 This note comprises instructions to be observed in order to follow directions, specifications, proper working procedure and to avoid data loss, damage or destruction of the instrument.

 This note signifies a warning about dangers to life and limb if the apparatus is handled improperly. Observe these notes and be particularly careful in these cases. Also inform other users on all safety notes. Besides the notes in these instruction manual the generally applicable safety instructions and regulations for prevention of accidents have to be taken into account.

1.2 Safety notes

 The “GlossTools” software is exclusively intended for measurement and data analysis for glossmeter types ZGM 1110, ZGM 1120 and ZGM 1130. Any other use is considered as not being in accordance with the intentions of the manufacturer. The manufacturer is not liable for damages resulting from inappropriate application. The user bears the full responsibility.

 Unauthorized modifications and changes of the “GlossTools” are not permitted.

 Reproduction without permission is not allowed.

2 Introduction

2.1 Summary

The ZGM 1110, ZGM 1120 and ZGM 1130 Glossmeter from Zehntner are precision instruments for the determination of all gloss ranges on different surfaces.

- ! For further device related information on the ZGM 1110, ZGM 1120 and ZGM 1130 Glossmeter e.g. Operating, Safety notes, Handling, Maintenance and Cleaning, Technical specification etc., please refer to the separate instruction manual.

The GlossTools measuring and examination software has been developed to support these glossmeters and provide a simple and easy to handle graphical user interface that offers the user so far unknown possibilities in the area of gloss measurement.

The multi-language software supports different measuring modes as well as the automatic calculation of statistical values such as minimum, maximum, average, standard deviation and difference to a given reference value. The measurements may be displayed in „GlossTools” or can be exported to Microsoft® Excel for further processing.

Unique diagnosis functions of the software indicate the system’s status and inform the user about errors or remind him to necessary calibrations.

Application / application areas:

- Determination of all gloss ranges for all sorts of different surfaces from mat to high gloss in all industries
- For the various needs of production and the demanding requirements in the laboratory

3 Delivery of device

3.1 Standard delivery

The „GlossTools” software package is included in delivery of the ZGM 1110, ZGM 1120 and ZGM1130 Zehntner-Glossmeter series.

- ! Zehntner GmbH Testing Instruments refuses all warranty and liability claims for damages caused by usage of the „GlossTools” software.


4 Install / Uninstall

4.1 System requirements

In order to install the „GlossTools“ software on your PC or laptop, the system shall meet the following requirements:


Operating system:	Microsoft® Windows XP SP3 or later
Required components:	.NET Framework 3.5 SP 1
• Memory (RAM):	min. 512 MB, recommended 1 GB
• Hard Disc space:	min. 120 MB


4.2 Installation of “GlossTools”

 Do not connect the glossmeter to your PC unless all installation steps of the „GlossTools“ software package have been performed.

The current version can be downloaded for free from our website www.zehntner.com.

Unzip the downloaded file and double click the setup.exe for the installation. At this point Windows will lead you through the remainder of the installation process.

 Depending on the configuration of your system, it might be possible that you have to install additional components. The „GlossTools Setup-Wizard“ will advise you to do, if necessary. Simply install the desired component by clicking on its corresponding link.

 If you use the ZGM 1120 together with RS232-adaption by optional article ACC195 or ACC195.fast, please refer to the separate addendum „Installation instruction for ZGM 1120 Glossmeter with RS232-adaption by optional article ACC195 or ACC195.fast (equipped with RS232 interface)“.

Zehntner recommends to install the latest „GlossTools“ version. For ZGM 1130 the 1.0.00.36 version is needed at least. However, should your IT advise you to install a former version, you need to observe the following instruction up to software version 1.0.0026:

Insert your „GlossTools“ Installation CD into your CD-ROM drive. A window which allows you to select the installation language should open after a few seconds. If not, please execute the file autostart.exe manually.

After selection of your desired language, a new window opens. Click on the links „Zehntner GlossTools” to install the software.

The Zehntner „GlossTools Setup-Wizard” will guide you through the installation process.

Install the „GlossTools” software and start Setup.exe as Administrator. For this you have to make a right mouse click on Setup.exe and select „Run as Administrator”. We recommend choosing the installation for every user. All „GlossTools” components are trustworthy. It might be that you have to consult your IT-Administrator for the installation.

- ! Depending on the configuration of your system, it might be possible that you have to install additional components. The „GlossTools” Setup-Wizard will advise you to do, if necessary. Simply install the desired component by clicking on its corresponding link.
- ! For proper functioning, you need to install all components for the „GlossTools”.

4.3 Removing “GlossTools”

In order to remove „GlossTools” software from your system go to

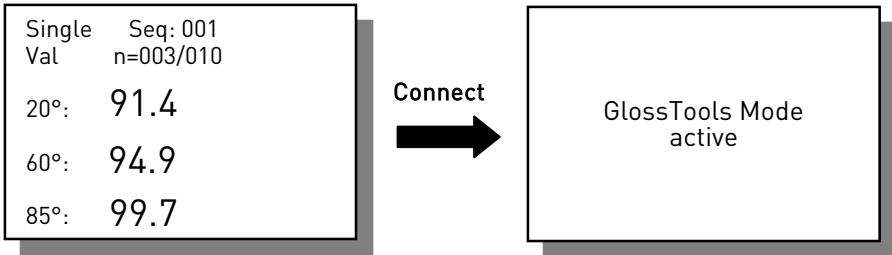
Start->Settings->Control Panel-> Add / Remove Programs and choose Zehntner „GlossTools” from the list of installed software. Click on **„Remove”** to uninstall the program.

5 Getting started

5.1 Starting up





Connect the ZGM 1110, ZGM 1120 or ZGM 1130 Glossmeter to your PC by using the included USB-cable and launch the GlossTools measuring and examination software.

When using the ZGM 1110 Glossmeter, please make sure that the main display is showed on the ZGM 1110 display when connecting to the „GlossTools” software. Otherwise, the instrument might not be recognised by the software in some cases.



After the successful connection to „GlossTools”, a message „GlossTools Mode active” will appear on the display of the ZGM 1110.

In case of using a ZGM 1130 connect the cable when seeing the measuring display and select the “Measure” option. Then you will be able to establish a communication between the „GlossTools” and the device.

Measuring display	Cable connected	Measure
10/3 SAMPLE4 20° 27.7 _{GU} ± 74.4 60° 70.9 _{GU} ± 88.4 85° 67.0 _{GU} ± 90.2	 Charge only  Download  Measure	

5.2 Language selection

After starting „GlossTools”, choose your preferred language under **Tools->Options->Language**.

5.3 Create or load a project

The „GlossTools“ measuring and examination software is fully project-based. This means, that a dedicated database will be created for every new project. Therefore, all the settings made in the project, for example selected measuring geometry, measuring mode etc. will also be stored with the project.

In order to work with „GlossTools“ you will have to create a new project, or load an existing project. This can be done by clicking one of the buttons „**New Project**“ or „**Open Project**“. Assign a name to your new project and also a “description of project” if desired. Then click „**OK**“. Alternatively you may select one of 5 recently opened projects from the list (if existing).

5.4 Selection of measuring geometry

Select your desired measuring geometry from the right pane in the tab

Measurement. If you have a 2- or 3-angle glossmeter, you may select more than one geometry at once.

5.5 Selection of the measuring mode

Select your desired measuring mode from the right pane in the tab **Measurement**.

You may choose between single and multiple measurements. For a multiple measurement, define an interval in seconds and a designated number of

measurements to be taken. Alternatively you can use the continuous measuring mode with a maximum number of measurements that can be defined in the **Options** in the tab **General**.

5.6 Measure

Place the glossmeter on the surface to be measured and start a single or multiple measurement by pressing the measuring button of the device or by clicking on the „**Measure**“ button in the software.

All measured values will be displayed in a table below the main display.

The measurements will be displayed in a graph on the left side beside the main display. To show or hide the main display or the graph, simply click on its corresponding symbol in the upper left corner of the graph.

5.7 Selection of display mode

Select your desired display mode from the right pane under the tab References.
The following modes can be chosen:

- Single value:** The displayed value in the main display corresponds to the last measured value in the table below.
- Average:** The displayed value in the main display corresponds to the average of all measurements in the table below.
- Difference:** The displayed value in the main display corresponds to the difference between the last measured value and a defined reference value (see also sub-clauses 6.15 and 7.7.2).

Actual statistical values for average, difference, minimum, maximum and standard deviation for all measurements in the table will be calculated and displayed in the lower left corner of the main display.

5.8 Calibration

It is necessary to calibrate the device from time to time. We recommend to calibrate the device at least every 2 days.



In addition to the delivered working standard, your ZGM 1110 / ZGM 1120 / ZGM 1130 can also be calibrated on other standards. Subsequently, the calibration standard delivered by the manufacturer will be referred to as working standard in this instruction manual.

„GlossTools“ offers for the ZGM 1110 and ZGM 1120 glossmeter two different modes of calibration:

- **Fast Calibration**
This option automatically calibrates all supported geometries on the device's working standard.
- **Extended Calibration**
This option allows the user to select the geometries to be calibrated and to choose between a calibration on the working standard and a calibration on a 2nd standard for every geometry.

For the ZGM 1130 a separate Calibration Wizard is used.

5.8.1 ZGM 1110 and ZGM 1120 Fast Calibration

For a fast calibration, carry out the following steps:

- Choose „**Calibrate**“ from menu.
- The GlossTools Calibration Wizard is being launched.



„GlossTools“ can be configured to automatically execute the GlossTools Calibration Wizard each time you put the device on its calibration standard. This can be done by activating the option.

„Start calibration process automatically if measuring head is put into standard“ in **Tools->Options->Current measuring head**.

- Activate the option „**Fast Calibration**“.
- Make sure that the device is in its calibration standard, then click „**Start**“.

„GlossTools“ now begins to calibrate all supported geometries immediately. If the calibration was successful, the Calibration Wizard closes automatically. If one or more calibrations have failed, click „**Details**“ for more information.

5.8.2 ZGM 1110 and ZGM 1120 Extended Calibration

For an extended calibration on the **working standard**, carry out the following steps:

- Choose „**Calibrate**“ from menu.
- The GlossTools Calibration Wizard is being launched.



„GlossTools“ can be configured to automatically execute the GlossTools Calibration Wizard each time you put the device on its calibration standard. This can be done by activating the option.

„Start calibration process automatically if measuring head is put into standard“ in **Tools->Options->Current measuring head**.

- Make sure that the option **Fast Calibration** is deactivated and click „**Start**“.
- Click „**Next**“ to select the angle(s) to be calibrated. Select „**Working Standard**“ in the column „**Standard**“ and click „**Next**“.
- The standard value(s) for the selected angle(s) will be displayed. Click „**Next**“.
- Make sure that the device is in its calibration standard, then click „**Start**“.

„GlossTools“ now begins to calibrate your selected geometries immediately and will inform you whether the calibration was successful or not. Additionally, the deviation of this calibration related to the Zehntner factory calibration is being displayed.

There is a possibility to calibrate the device on a 2nd standard. This could be a standard prescribed by your company or a reference specimen for instance. The

actual information on calibration will be displayed on the left side of the main screen in the „**Angle**” tab.

For an extended calibration on a **2nd standard**, carry out the following steps:

- Choose „**Calibrate**” from menu.
- The GlossTools Calibration Wizard is being launched.
- Make sure that the option „**Fast Calibration**” is deactivated and click „**Start**”.
- Click „**Next**” to select the angle(s) to be calibrated. Select „**2nd Standard**” in the column „**Standard**”. You may enter a custom standard name if you like. Then click „**Next**”.
- Enter the standard value(s) for the selected angle(s). Click „**Next**”.
- Make sure that the device is placed on the 2nd standard, then click „**Start**” and follow the instructions of the Calibration Wizard.

5.8.3 ZGM 1130 Calibration

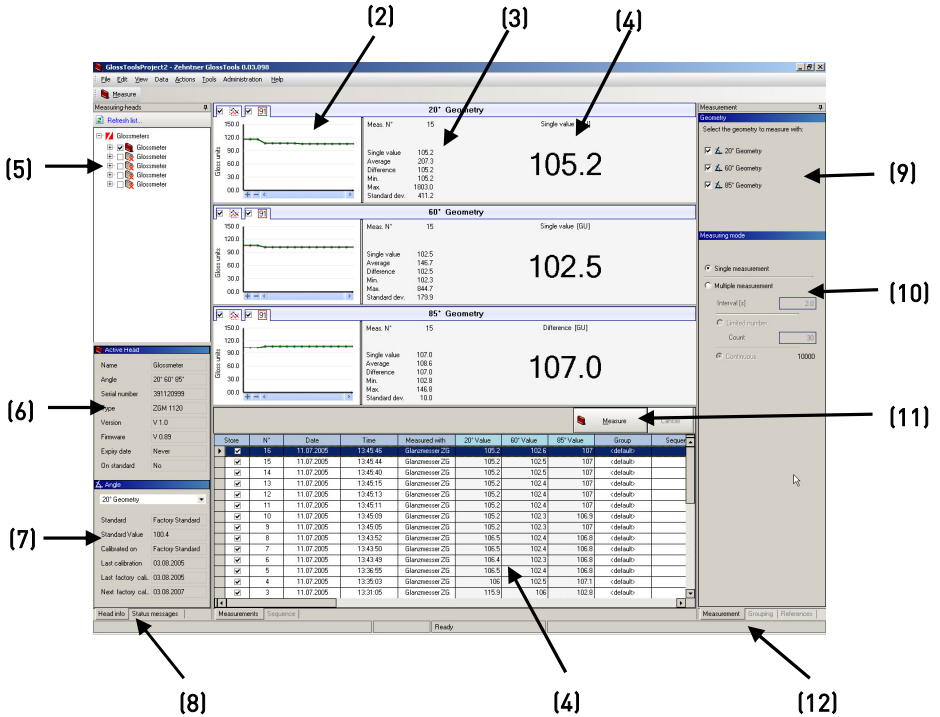
The following steps have to be carried out:

- Choose „**Calibrate**” from menu.
- The “GlossTools” Calibration Wizard is being launched.
- Set values according to the working standard or to the used calibration plate.
- After the calibration was made, decide to accept it with „**Accept**” or to refuse it with „**Cancel**”.

For more information on this topic see sub-clause 7.6.2.

6 Components of the main screen

6.1 Overview of the main screen



6.2 Key

- (1) Main display (see sub-clause 6.3)
- (2) Graphical display (see sub-clause 6.4)
- (3) Statistical values
- (4) Table (see sub-clause 6.5)
- (5) Measuring head selection (see sub-clause 6.6)
- (6) Information on active head (see sub-clause 6.7)
- (7) Information on measuring geometry (see sub-clause 6.8)
- (8) Tab Head info | Status messages (see sub-clause 6.9)
- (9) Measuring geometry selection (see sub-clause 6.10)
- (10) Measuring mode selection (see sub-clause 6.11)
- (11) Button Measure
- (12) Tab Measurement | Grouping | References (see sub-clauses 6.12 to 6.16)

6.3 Main display

The indication in the main display depends on the selected measuring mode (see sub-clause 5.6 and 6.16). Actual statistical values for average, difference, minimum, maximum and standard deviation for all measurements in the table will be calculated and displayed in the lower left corner of the main display.

To show or hide the main display, click on its corresponding symbol in the upper left corner of the graph.

6.4 Graphical display

In this section of the main screen, all measurements contained in the table will be displayed as a graph.

To show or hide the graphical display, click on its corresponding symbol in the upper left corner of the graph.

6.5 Table

The table is situated below the main display and the graph. This table is being updated after every measurement. In addition to the measured values, further data information such as date, time, reference value etc. will be displayed in the columns of the table.

A right-click in the table area opens a context menu, which lets you edit the measurements (see sub-clause 7.3).

6.6 Selection of measuring head

„GlossTools“ is able to manage more than one ZGM 1110 / ZGM 1120 / ZGM 1130. But it is not possible to measure with more than one device at the same time. The measuring head selection pane will show you all the detected devices and give you information on the supported geometries of each device.

If you connect a new measuring head you may have to click the button „**Refresh list...**“ in order to let “GlossTools” detect the device. The new glossmeter will appear in the list and will be marked as the active head.

6.7 Information on active head

In this pane, the following information on the active measuring head will be displayed:

Active Head	
Name	Glossmeter
Angle	20° 60° 85°
Serial number	391120999
Type	ZGM 1120
Version	V 1.0
Firmware	V 0.89
Expiry date	Never
On standard	Yes

Name:

Name of the measuring head

Angle:

Supported measuring geometries

Serial number:

Zehntner serial number

Type:

Description of the measuring head

Version:

Version number

Firmware:

Software version of the electronics

Expiry date:

Expiry date – only for rented devices

On Standard:

Indicates whether the measuring head is in its calibration standard or not

Not every value is set for all devices.

6.8 Information on measuring geometry

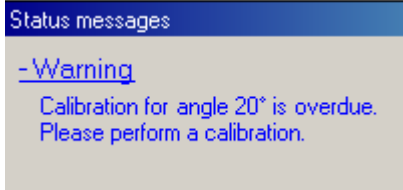
Angle	
60° Geometry	▼
Standard	Factory Standard
Standard Value	97.2
Calibrated on	Factory Standard
Last calibration	03.08.2005
Last factory cali..	19.07.2005
Next factory cal..	19.07.2007

This pane shows calibration information on the supported measuring geometries of the active device. In case your device is a 2- or 3-angle model, you can select the desired geometry from the combo box.

Not every value is set for all devices.

6.9 Status messages

“GlossTools” includes unique status manager functionalities which draw the user’s attention to several events. This might be a calibration which is overdue or which is necessary by reason of ambient conditions that have changed since the last calibration. Moreover, “GlossTools” puts you on enquiry if Zehntner factory calibration becomes necessary.



6.10 Selection of measuring geometry

Select your desired measuring geometry. You may select more than one geometry in case you use a 2- or 3-angle model (see also sub-clause 5.4).

6.11 Selection of measuring mode

Select the desired „**measuring mode**” for your measurements. You may choose between single and multiple measurements. For a multiple measurement, define an interval in seconds and a designated number of measurements to be taken. Alternatively, you can use the continuous measuring mode with a maximum number of measurements that can be defined in the „**Options**” in the tab „**General**” (see also sub-clauses 5.5 and 7.7.1).

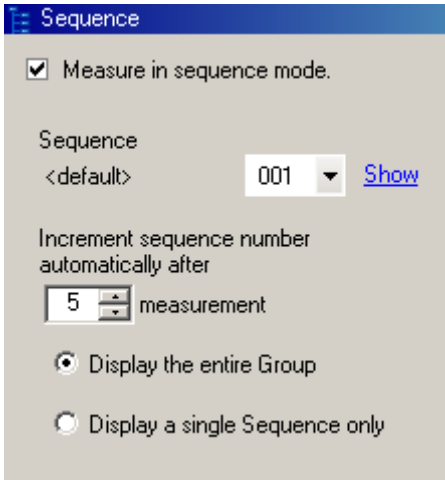
6.12 Groups

Sometimes it may be helpful to divide multiple measurements of one specimen into groups. Assumed, you would like to analyse and document the influence of ageing of a surface on its gloss you can simply make measurements in regular time intervals (e.g. days / weeks) and store them separately in different groups. This will ease the management of your measuring data and help you to retain the overview with lots of measurements.

In the tab „**Grouping**” on the right side of the main screen you may define and manage measuring groups.

For further information on this topic see also sub-clause 8.1.

6.13 Sequences



In addition to grouping measurements, “GlossTools” allows you to split groups into sequences containing a user defined number of measurements.

In the „**Sequence**” pane you can define the number of measurements per sequence and whether you want to display the entire group in the table or only the current sequence.

Click on „**Show**” to display the measurements of the current sequence in the table.

The sequence number is automatically being incremented after the number of measurements specified in the pane.

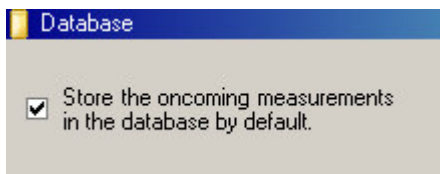
For further information on this topic see also sub-clause 8.2.

6.14 Database

If you activate the option „**Store the oncoming measurements in the database by default**” in the pane „**Database**”, all the oncoming measurements will automatically be stored in the “GlossTools” database. If so, they will be available the next time you start the „GlossTools” software and load the same project.

- ! All the measurements that have not been saved before closing a project or leaving the „GlossTools” software will be lost if this functionality is deactivated.

The column „**Store**” in the table indicates whether a measurement has been stored in the database or not.



6.15 References

In the tab „**References**” on the right side of the main screen you may define and manage reference values for measurements.

There are basically two different types of references available:

- | | |
|---------------------------|---|
| Global references | These references are available for all “GlossTools” projects. |
| Project references | These references are only available for the current “GlossTools” project. |

By setting an upper and a lower limit you can define a range of tolerance for a specimen. If a measured value lies between these limits, the main display will appear green-coloured. Otherwise it will appear red-coloured.

Additionally, the upper and lower limit will be displayed as red lines in the graph.

For further information on this topic see also sub-clauses 7.7.2 and 8.3.


6.16 Display mode

Select your desired display for the main display.

The following modes can be chosen from the tab „**References**”:

- | | |
|----------------------|--|
| Single value: | The displayed value in the main display corresponds to the last measured value in the table below. |
| Average: | The displayed value in the main display corresponds to the average of all measurements in the table below. |
| Difference: | The displayed value in the main display corresponds to the difference between the last measured value and a defined reference value (see also sub-clauses 6.15 and 7.7.2). |

Actual statistical values for average, difference, minimum, maximum and standard deviation for all measurements in the table will be calculated and displayed in the lower left corner of the main display.

-  If you have activated the function „**Display a single sequence only**” under „**Sequences**” in the tab „**Grouping**”, the statistical value will be calculated only for the measurements of the current sequence! Otherwise, the statistical values are calculated for all measurements of the current group (see also sub-clause 6.13).

7 Overview of main menu

7.1 Menu File

7.1.1 New Project

This menu item will create a new “GlossTools” project. You may type in a name and choose the path where the project will be created. Add an optional description for the project if you wish.

- ! The „GlossTools” software is fully project-based. This means that a dedicated database is being created for every new project. Therefore, all the settings made in the project, for example selected measuring geometry, measuring mode etc. will also be stored with the project.

“GlossTools” creates an appropriate folder named by the project name for every new project created. The default path for „GlossTools” projects is **My Documents\GlossTools**, but it can also be chosen by the user when creating a new project. The project folder contains the project file (*.gtp) and an additional folder data, which contains all the necessary configuration files for the project specific settings. If you would like copy an existing project to a different location, make sure that you always copy the whole project folder including the data folder and the *.gtp-File. This way, „GlossTools” will find all the required configuration files when opening the project the next time.

7.1.2 Open Project

This menu item allows you to load an existing „GlossTools” project file (*.gtp file). Note: The „GlossTools” software is fully project-based. This means that a dedicated database is being created for every new project. Therefore, all the settings made in the project, for example selected measuring geometry, measuring mode etc. will also be stored with the project.

7.1.3 Recent Projects

Choose one of max. five recently opened projects from the list to load.

7.1.4 Close Projects

Closes the currently opened project and goes back to the start page.

- ! All the measurements that have not been saved before closing a project will be lost.

The column „**Store**” in the table indicates whether a measurement has been stored in the database or not.

7.2 Quit

This will close the „GlossTools” software.

- ! All the measurements that have not been saved before closing the „GlossTools” software will be lost.

The column „**Store**” in the table indicates whether a measurement has been stored in the database or not.

7.3 Menu Edit

Note: All functions from the menu „**Edit**” are also accessible through the context menu of the table. This will appear by clicking the right mouse button in the table area.

7.3.1 Show measurement

This menu item allows you to display a measurement from the table in the main display.

Mark the desired measurement in the table by clicking its row in the left-most position until it appears blue-coloured. Then choose „**Show measurement**” from the menu.

7.3.2 Edit measurement

This menu item allows you to assign a specimen name and remarks to a measurement from the table.

Mark the desired measurement in the table by clicking its row in the left-most position until it appears blue-coloured. Then choose „**Edit measurement**” from the menu.

7.3.3 Store measurement(s) in database

This menu item allows you to choose for every measurement in the table individually, whether it will be stored in the database or not. The current state can be seen in the column „**Store**” of the table.

Mark the desired measurement(s) in the table by clicking the row(s) in the left-most position until they appear blue-coloured. Then choose „**Store measurement(s) in database**” from the menu.

Alternatively, you may activate the option „**Store the oncoming measurements in the database by default**” in the pane „**Database**” to store all oncoming measurements in the database by default.

7.3.4 Don't store measurement(s) in database

This menu item allows you to choose for every measurement in the table individually, whether it will be stored in the database or not. The current state can be seen in the column „Store” of the table.

Mark the desired measurement(s) in the table by clicking the row(s) in the leftmost position until they appear blue-coloured. Then choose „**Don't store measurement(s) in database**” from the menu.

- ! All the measurements that haven't been saved before closing a project or leaving the “GlossTools” software will be lost.

Alternatively, you may activate the option „**Store the oncoming measurements in the database by default**” in the pane „**Database**” to store all oncoming measurements in the database by default.

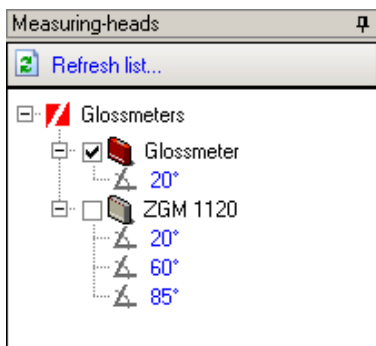
7.3.5 Delete measurement(s)

This menu item allows you to delete one or more measurements from the table. Mark the desired measurement(s) in the table by clicking the row(s) in the leftmost position until they appear blue-coloured. Then choose „**Delete measurement(s)**” from the menu.

7.4 Menu View

7.4.1 Refresh measuring heads list

This menu item allows you to refresh the list of the currently connected measuring heads. This may be necessary particularly if you connect a new measuring head to the system. The first measuring head detected by the system will be marked as the active head by check mark. If you would like to activate another connected measuring head, just set its check mark.



Alternatively, you may use the button „**Refresh list...**” in the pane „**Measuring-heads**” in the upper left corner of the main screen to execute this function.

7.4.2 Fullscreen

This menu item allows you to enlarge the display area of the main display, the graph and the table. The panes on both sides of the main screen will be minimized and appear as vertical bars on both sides of the main screen.

7.4.3 Reset Window

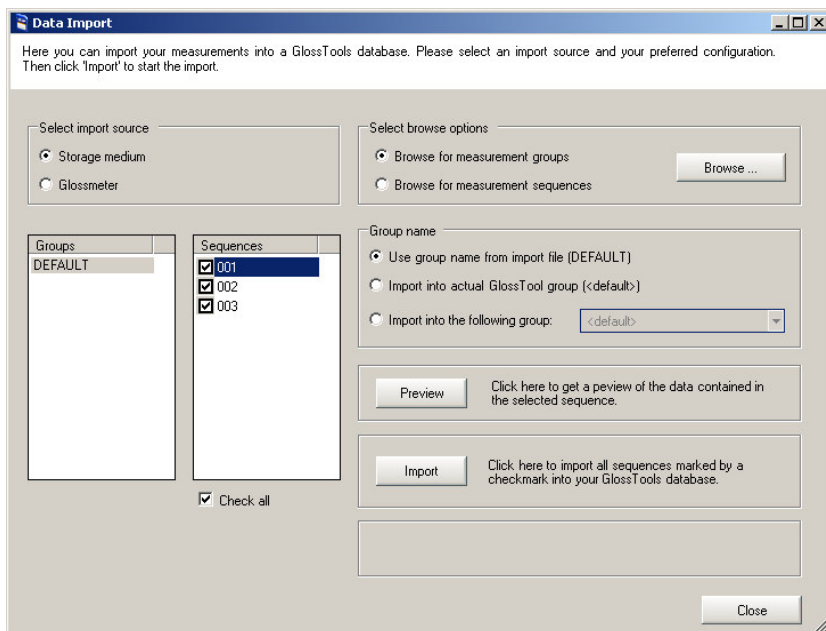
This menu item resets the screen view back to the normal screen mode.

7.5 Menu Data

In the „Data” menu you will find unique reporting, import and export functionalities, which allow you easily to generate customized reports of your measuring data and reduce the effort for documentation to a minimum.

7.5.1 Data Import

This menu item offers users of the ZGM 1110 and ZGM 1130 Glossmeter powerful facilities to import measurement data into the „GlossTools” database.



Importing data from ZGM 1110

There are two possibilities to import your data from a ZGM 1110:

1. Import from a storage medium

Due to the better performance, this method should be preferred if lots of data needs to be imported. Possible import sources can be for hard disk drives, USB sticks or memory cards for example.

To import data from a storage medium, carry out the following steps:

- Select "Storage medium" radio button.
- Select your desired measurement group or file(s).
- "Browse for measurement groups" allows to select an entire measurement group folder. All measurement sequences (*.zdf-Files) contained in this folder will automatically be available for import.
- "Browse for measurement sequence" allows to select one or more measurement files (*.zdf-Files). Only the selected sequence(s) will be available for import.
- Go to the "Group name" area and select the group name of the "GlossTools" database you wish to import the data to. You may choose between original the group name of the measurement file and the current active "GlossTools" group, an existing group in the current "GlossTools" project. It is also possible to import to a new "GlossTools" group by entering a group name in the edit field.

Now, the name of each measurement group containing a selected sequence file, appear in the "Groups" listbox. Navigate to the desired data by clicking on the corresponding group name in the "Groups" listbox.

To see a preview of the measurement data, select the desired measurement sequence in the "Sequences" listbox and click the „**Preview**” button.

- Make sure that every sequence you wish to import is checked by a checkmark and press the „**Import**” button to import the data.

Note: Depending on the amount of data to be imported, the import procedure can take a few seconds to minutes.

2. Import directly from an attached glossmeter

Due to the lower performance, this method should be preferred if there are only a few measurements to import, or no card reader is available to import data from the memory card.

- Select „Glossmeter” as import source.

All available group names will be listed in the „Groups” listbox.

The subsequent import procedure is the same as importing data from a storage medium.

Importing data from ZGM 1130

The import of ZGM 1130 data from storage medium or a directory is basically the same procedure described in the section **“Import from a storage medium”** above (except files are ending .CSV and not with .zdf).

To import ZGM 1130 data directly from the device following user interactions are required:

- Disconnect in the “Data Import” form the cable of the ZGM 1130 and reconnect.
- Select “Download” on the device.
- Then the device will be accessible from the PC as a mass storage device and the data can be imported as described in the section **“Import from a storage medium”** above.
- After importing and before closing “Data Import”, disconnect the cable of the ZGM 1130 and reconnect. Then select “Measure” on the device.

7.5.2 Report

This menu item offers you extensive facilities for generating report. In addition to general information on the measuring head, the reports illustrate statistical data and the measured values in a clearly laid-out way. From a simple predetermined report to a customized report hierarchically structured by sequences, „GlossTools” leaves nothing to be desired. The reports can be printed out directly from „GlossTools”, or can be saved as a PDF file. Please also refer to chapter 8.4 “Working with Reports” on page 34.

7.5.3 Export to Microsoft® Excel

This menu item allows you to export your measuring data directly into Microsoft® Excel worksheet. You can choose to integrate only the current group or also all groups of the project. In accordance with your selection, the report is presented as a flat data structure or hierarchical structure – ordered by groups and sequences.

7.5.4 Export to XML file

This menu item allows you to export the measuring data of the table into a XML file (Extensible Markup Language).

7.6 Menu Actions

7.6.1 Measure

This menu item allows you to start single or multiple measurements. Alternatively, this function is accessible by pressing one of the buttons „**Measure**” on the main screen or the button on the device.

Note: You can make several measurements in a row by pressing and holding the button on the glossmeter device. Release the button after „GlossTools” has taken the desired number of measurements.

7.6.2 Calibrate

It is necessary to calibrate the device from time to time. This may be required particularly if ambient conditions (e.g. air temperature, relative humidity) have changed since the last calibration. It is recommended to calibrate the device at least every 2 days.

This menu item allows you to start the „GlossTools Calibration Wizard”, which will guide you through the whole process of calibration. Just follow the instructions.

There is a possibility to calibrate the device on a 2nd standard. This could be a standard prescribed by your company or a reference specimen for instance. The actual information on calibration will be displayed on the left side of the main screen in the „**Angle**” tab (see also sub-clause 6.8).

For more information on this topic see sub-clause 5.8.

7.7 Menu Tools

7.7.1 Options

The programme options let you make several settings concerning project, measuring head, language, database and graphical display. The options window consists of five or six tabs depending on the glossmeter model:

Active Project:

- **Description:**
Add an optional description for your current project.

Current measuring head:

- ***Name of measuring head:***
Assign an accurate name to your glossmeter device (e.g. Laboratory 1 etc.).
- ***Customer name:***
Fill in your company name here for example.
- ***Start calibration process automatically if measuring head is put into standard:***
This option will activate or deactivate the automatic recognition of the calibration standard. If activated, the „GlossTools Calibration Wizard“ will be started automatically each time you put the glossmeter into its calibration standard.
- ***Show favourite angle if available:***
If this option is activated, all measuring geometries whose measuring values are between 10 and 70 gloss units will be marked as favourite angle – in accordance with ASTM D523. This is done by underlining the value shown in the main display.

Language:

- **Language:**
Select your preferred language here.

General:

General Constraints:

- *Max. of measuring heads that can be connected:*
Number of measuring heads "GlossTools" is able to manage.
The default value is 10.
- *Max. of measurements for a group:*
Fill in any number between 0 and 100 000.
A recommended value is 1000.
- *Max. of measurements to be written into database:*
This specifies how many measurements can be stored in the project database. Fill in any number between 0 and 100'000.
A recommended value is 10 000.
- *Number of measurements to be displayed in graph:*
Fill in any number between 0 and 100 000.
A recommended value is 5000.

Graph:

Choose between automatic or manual scaling of the ordinate (Y-axis) of the graph.

Advanced

The „Advanced“ tab is only enabled if a ZGM 1110 Glossmeter is attached and active. When using ZGM 1120 and ZGM 1130, this tab will be disabled.

- *Synchronize date / time to PC:*
This function enables you to synchronize the internal clock of the ZGM 1110 to the current date and time of your PC by clicking the button „**Sync**“.
To read the current date / time of the internal clock of the ZGM 1110, click the button „**Read Time**“.
- *Enable Beep:*
If activated, the ZGM 1110 Glossmeter will issue a short acoustic signal when performing a measurement.

RS232:

- *Enable RS232 device detection:*
If you use a ZGM 1120 Glossmeter with RS232-adaption by optional article ACC195 or ACC195.fast, you need to enable the RS232 device detection. The RS232 device detection recognises ZGM 1120 Glossmeters which are connected by RS232 interface.
- *Use the specific COM:*
Here you have the possibility to allocate a specific COM-Port. This will speed up the response time when using the RS232 interface.
- *Use RS232 fast:*
You can enable RS232 fast here in case the device supports the RS232 fast mode.

Measuring Unit:

- *Measure in %:*
Here you can choose the measuring unit GU or %.
This setting is only applicable for ZGM1110 or ZGM1120 Glossmeters.

7.7.2 Manage References

This menu item allows you to define and manage reference values for measurements.

	Ref. value	Upper limit	Lower limit
Angle 20°	50.0	100.0	10.0
Angle 60°	50.0	100.0	10.0
Angle 85°	50.0	100.0	10.0

By setting an upper and a lower limit you can define a range of tolerance for a specimen. If a measured value lies between these limits, the main display will appear green-coloured. Otherwise it will be red-coloured.

Additionally, the upper and lower limit will be displayed as red lines in the graph.

Select a reference here or click on "Manage references" to add, modify or delete references.

Reference 1

[Manage references ...](#)

The desired reference has to be selected from the tab „References” in order to become activated.

7.7.3 Lock / Unlock Software

This menu item allows you to lock the „GlossTools“ by a user-defined password. In locked state, all the facilities to change settings will be disabled. In this way, the modification of important project settings (intentionally or not) may be prevented. However, basic functionalities like measuring, calibrating or all kind of exports are still enabled and can be used.

7.7.4 User Roles

The user administration is not needed by the users of the ZGM 1110, ZGM 1120 and ZGM 1130.

7.8 Menu Help

7.8.1 Manuals

This menu item allows you to load the instruction manuals for “GlossTools” and the supported devices as a PDF-file (*.pdf).

7.8.2 Contact

This menu item opens a window, which gives you contact information and a link to the webpage of **Zehntner GmbH Testing Instruments**.

8 Working with “GlossTools”

8.1 Working with Groups

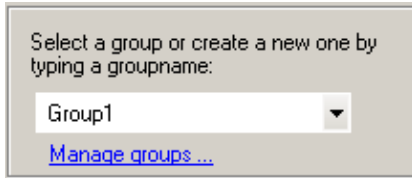
Sometimes it may be helpful to divide multiple measurements of one specimen into groups. Assumed, you would like to analyse and document the influence of ageing of a surface on its gloss you can simply make measurements in regular time intervals (e.g. days / weeks) and store them separately in different groups. This will ease the management of your measuring data and help you to retain the overview of lots of measurements.

8.1.1 Create a new group

As long as you have not created an appropriate new group, „GlossTools“ uses its <default> group for all measurements.

To create a new group in your current project, do the following steps:

1. Select the tab „Grouping” from the panel on the right side of the main screen.
2. Enter a group name in the input field.



3. Start a measurement.

All oncoming measurements will be assigned to this group. If you want to create another group, just repeat the steps 1 though 3.

8.1.2 Delete a group

To delete an existing group from your current project, do the following steps:

1. Select the tab „Grouping” from the panel on the right side of the main screen.
2. Click on „Manage groups...”
3. Select the group from the window „Groups” on the left side.
4. Click the button „Delete Group”.

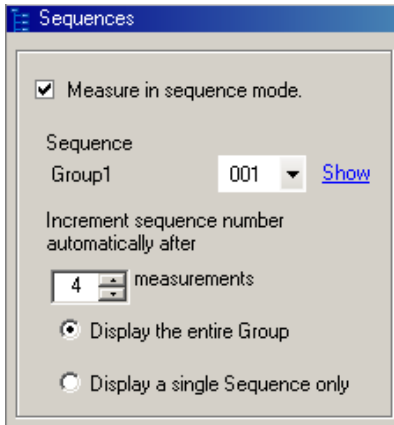
8.2 Working with Sequences

You can store multiple sequences each containing a defined number of measurements in one group. Sequences may be helpful if you always need to take the same number of measurements from a large number of similar specimens.

8.2.1 Create a new sequence

To create a new sequence in an existing group, do the following steps:

1. Select the tab „Grouping” from the panel on the right side of the main screen.
2. Select the group to which you want to add a sequence.
3. Check the function „Measure in sequence mode”.



The first sequence will automatically be numbered as 001.

Indicate the number of measurements a sequence will contain, respectively, after how many measurements the sequence number will automatically be incremented.

Choose if you want to display all measurements of the group, or only the measurements of the current sequence.

4. Start your measurements. The example above will automatically increment the sequence number to 002 after the 4th measurement.

8.2.2 Display a sequence

To display a sequence of an existing group, do the following steps:

1. Select the tab **„Grouping“** from the panel on the right side of the main screen.
2. Select the group which contains the sequence you want to display.
3. Select the number of the sequence you wish to display and click **“Show”**.

8.2.3 Delete a sequence

To delete a sequence from an existing group, do the following steps:

1. Select the tab **„Grouping“** from the panel on the right side of the main screen.
2. Click on **„Manage groups...“**
3. Select the group from the window **„Groups“** which contains the sequence you want to delete.
4. Select the sequence you want to delete from the window **„Sequences“**.
5. Click the button **„Delete Seq“**.

8.3 Working with References

Sometimes it occurs that you have a reference sample of a specimen and you just want to compare other specimens with this reference sample. When using the references functionality of „GlossTools“, you can define such a reference value. By setting an upper and a lower limit you can also define a range of tolerance for a specimen. If a measured value lies between these limits, the main display will appear green-coloured. Otherwise it will appear red-coloured.

8.3.1 Create a reference

To create a reference in an existing project, do the following steps:

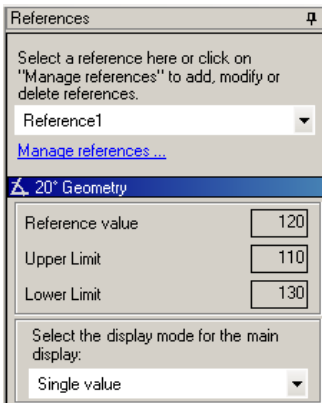
1. Select the tab **„References“** from the panel on the right side of the main screen.
2. Click on **„Manage references...“**
3. Select type of reference you want to create (global or project-only).
4. Click the button **„New“**.
5. Enter a reference name, a target value (Ref value), a lower and an upper limit in gloss units.

Ref value	Upper limit	Lower limit	
Angle 20°	120.0	110.0	130.0

6. Click the button **„OK“**.

Select your new reference from the box in the tab **„References“** in order to activate it (see also sub-clause 8.3.2).

8.3.2 Select a reference



In order to activate an existing reference, select it from the box in the tab „References”.

The corresponding values for the reference value, the upper and lower limit will be displayed in the pane below.

8.3.3 Edit a reference

To edit a reference in an existing project, do the following steps:

1. Select the tab „**References**” from the panel on the right side of the main screen.
2. Click on „**Manage references...**”
3. Select type of reference (global or project-only).
4. Select the reference you want to edit.
5. Click the button „**Edit**”.
6. Now you can edit the reference name, the reference value, the upper and lower limit.

8.3.4 Delete a reference

To edit a reference in an existing project, do the following steps:

1. Select the tab „**References**” from the panel on the right side of the main screen.
2. Click on „**Manage references...**”
3. Select type of reference (global or project-only).
4. Select the reference you want to delete.
5. Click the button „**Delete**”.

The selected reference will disappear from the list after confirming the prompt.

8.3.5 Import a reference

„GlossTools“ allows you to import references into a project. This way you can create frequently used references once and import them into your future projects and you will not have to recreate them for every new project.

References are stored in the project folder under *dataReferences.xml*.

To import an existing reference (e.g. from another project), do the following steps:

1. Select the tab „**References**“ from the panel on the right side of the main screen.
2. Click on „**Manage references...**“
3. Select type of reference (global or project-only).
4. Click the button „**Import...**“
5. Now select the reference file of your desired project.

After click on the button „**Open**“ the references contained in the selected reference file will be added to the reference list of your current project. Possible duplicates are designated by an additional “1” at the end of the name.

8.4 Working with Reports

„GlossTools“ offers you unique reporting and export functionalities, which allow you easily to generate customized reports of your measuring data and reduce the effort for documentation to a minimum.

8.4.1 Report

This menu item offers you extensive facilities for generating report. In addition to general information on the measuring head, the reports illustrate statistical data and the measured values in a clearly laid-out way. From a simple predetermined report to a customized report hierarchical structured by sequences, „GlossTools“ leaves nothing to be desired. The reports can be printed out directly from „GlossTools“, or can be saved as a PDF file.

To create a report, do the following steps:

1. Select the menu item **„Report“** from the menu **„Data“**. The following window will appear:

Here you can create a measurement report. Please select your preferred configuration and click 'Create Report' to create the report.

Create a simple report

Create a detailed report

Create a detailed report (compact)

Select a group:
<default>

Show logo in the report head

Report logo with aspect ratio 4:6

Title of the report:

Group	Manufacturer	Serialnumber	Customer	Device name	Measured with	20° Manufacturer	20° Count	20° Average	20° Min	20° Max	20° Standard dev.	60° Count
<default>	Zehntner Testing I	411110999	Customer	ZGM 1110	Glossmeter		3	94.2	94.2	94.2	0	3
N°	Date	Time	20° Value	60° Value	85° Value	Group						
1	18.03.2008	16:56:15	94.2	97.3	99.6	<default>						
2	18.03.2008	16:56:17	94.2	97.3	99.6	<default>						
3	18.03.2008	16:56:19	94.2	97.3	99.6	<default>						

For advanced users
 Load a customized report:

In this window you can make the following settings:

Create a simple report

This function creates a simple predefined report. It displays information on the measuring head as well as statistical values of the current group. The measurements will be listed below with indication of date and time of measurement, gloss value and sample name.

Create a detailed report

This function creates a detailed report. Compared to the simple report, the data is structured by sequences. In addition to the statistical values of the sequences, it lists also all the measurements contained in the sequence (with date and time of measurement, gloss value and sample name).

Create a detailed report (compact)

Compared to the detailed report, the measurements that are contained in the sequence will not be listed by default. But they can be displayed by clicking on **„Show Details“**.

Select group

This function includes the measuring data from the selected group in the report. By default, the current group is selected.

Show logo in the report head

This function enables you to place a picture (e.g. your company logo) on the report. The picture needs an aspect ratio of 4:6 and has to be a JPG file.

Title of the Report

Enter a title for you report.

Load a customized report

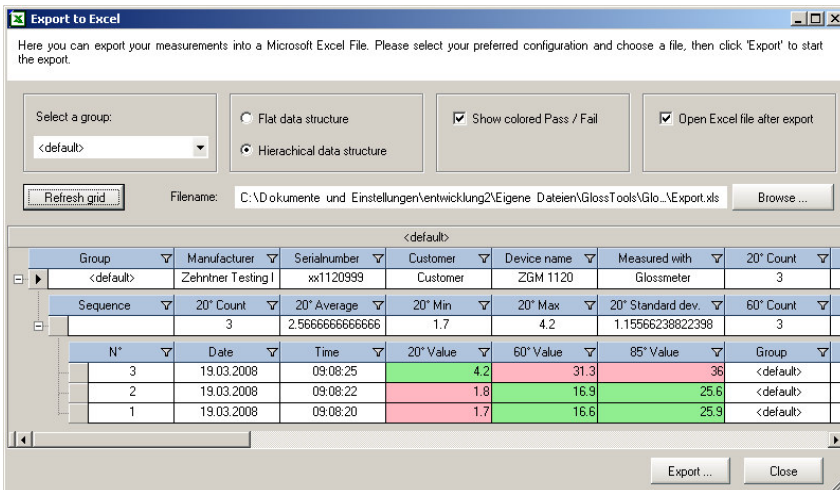
This function offers advanced users to load customized templates for their reports

8.4.2 Export to Microsoft® Excel

This menu item allows you to export your measuring data directly into Microsoft® Excel worksheet. You can choose to integrate only the current group or also all groups of the project. In accordance with your selection, the report is presented as a flat data structure or hierarchical structure – ordered by groups and sequences.

To perform an export to Excel, do the following steps:

1. Select the menu item „Export to Excel” from the menu „Data”. The following window will appear:



In this window you can make the following settings:

Select group

This function includes the measuring data from the selected group in the report. By default, the current group is selected.

Data for all groups

This function includes the measuring data of all groups of the project in the report.

Flat data structure

This function shows the measuring data in a flat data structure

Hierarchical data structure

Shows the measuring data in a hierarchical data structure – ordered by groups and sequences.

Show coloured Pass / Fail

Shows the pass / fail state of measurements when measured by using a reference value and a range of tolerance.

Open Excel file after export

Automatically opens an Excel worksheet after exporting your data.

Filename

Choose the path and the filename for your Microsoft® Excel worksheet.

Additionally, you can apply various **filter criteria** for export by clicking the filter symbol on the right side of the blue-coloured fields

8.4.3 Export to XML file

This menu item allows you to export the measuring data of the table into a XML file (Extensible Markup Language).

8.4.4 Creating average with groups

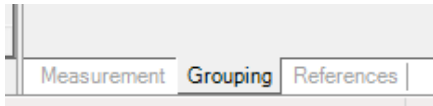
You wish to determine the average of different samples or of the same sample though with different time and then to export these to Microsoft® Excel worksheet.

Solution

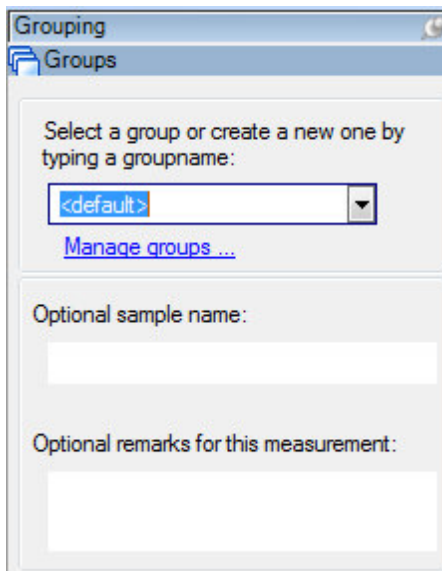
It is possible to create more groups within a project. These groups can be named individually. In order to see the average in an exported Excel sheet, the hierarchical data structure has to be chosen in menu item Export to Excel.

Procedure:

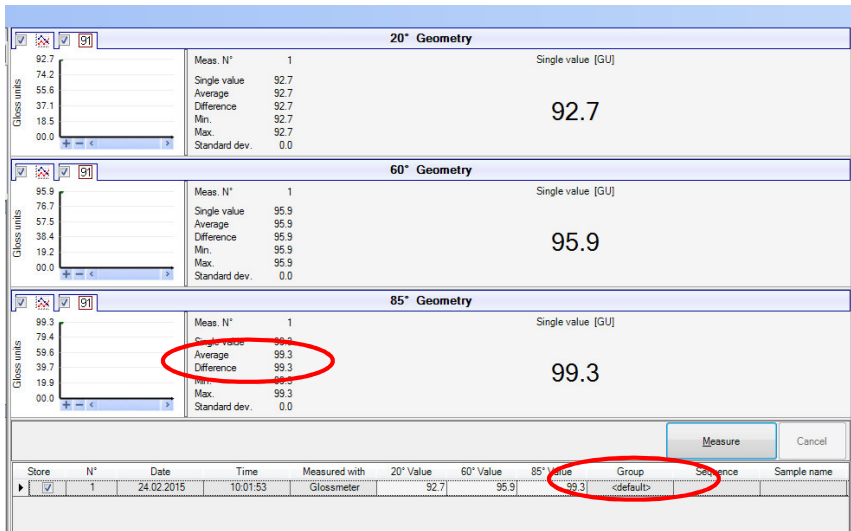
1. Generate a project for each product.
2. Choose grouping at the bottom right in the opened project.



3. Now different groups can be created at the top right. For this just give the name of the group under "Groups".



- From now on all future measurings will be added to this group.



- If the same product will be measured again, it is possible to create a new group (e.g. according to weathering).

The 'Grouping' dialog box contains the following elements:

- Groups:** A dropdown menu showing 'acc. to weathering' and a 'Manage groups ...' link.
- Optional sample name:** An empty text input field.
- Optional remarks for this measurement:** A larger empty text area.

- All the following measurements will be added to this group and a separate average will be determined for this group.

20° Geometry

Meas. N°	3
Single value	92.9
Average	92.9
Difference	92.9
Min.	92.9
Max.	92.9
Standard dev.	0.0

60° Geometry

Meas. N°	3
Single value	96.0
Average	96.0
Difference	96.0
Min.	96.0
Max.	96.0
Standard dev.	0.0

85° Geometry

Meas. N°	3
Single value	99.4
Average	99.4
Difference	99.4
Min.	99.4
Max.	99.4
Standard dev.	0.0

Store	N°	Date	Time	Measured with	20° Value	60° Value	85° Value	Group	Sequence	Sample name
✓	3	24.02.2015	10:30:20	Glossmeter	92.9	96.0	99.4	acc. to weathering		
✓	2	24.02.2015	10:30:14	Glossmeter	92.9	96.0	99.4	acc. to weathering		
✓	1	24.02.2015	10:30:03	Glossmeter	92.9	96.0	99.4	acc. to weathering		

- If the measurements with average should be exported to Excel, select (Data) → (Export to Excel) and hierarchical data structure. Please also refer to chapter 7.5.3 „Export to Microsoft® Excel“ on page 25

Export to Excel

Here you can export your measurements into a Microsoft Excel File. Please select your preferred configuration and choose a file, then click 'Export' to start the export.

Select a group: **acc. to weathering**

Flat data structure Show colored Pass / Fail Open Excel file after export

Hierarchical data structure

Refresh grid File name: C:\Users\Verkauf13.ZEHNTNER\GMBH\Documents\GlossTools\Project1\Export.xls Browse ...

N°	Date	Time	20° Value	60° Value	85° Value	Group	20° Upper limit	20° Referer
3	24.02.2015	10:30:20	92.9	96	99.4	acc. to weathering	0	
2	24.02.2015	10:30:14	92.9	96	99.4	acc. to weathering	0	
1	24.02.2015	10:30:03	92.9	96	99.4	acc. to weathering	0	

Export ... Close

9 Practical measuring suggestions

9.1 General

- ! Basically, proper measurements are only possible on even, clean and unscratched surfaces.
- ! Always indicate the measuring geometry for all measurements.
- ! Measurements of different measuring geometries cannot be compared and cannot be “converted” from one geometry into another. Therefore a series of measurement must always be taken with the same measuring geometry.

9.2 Application areas of all gloss geometries

Geometry	20°	60°	85°	45°
Application	Automotive, paint, varnish, plastics and manufacturing industry			Automotive, ceramics, foils and textile industry
	high-gloss	semi-gloss	low-gloss	semi-gloss
Standards				
ASTM C 346				•
ASTM D 523	•	•	•	
ASTM D 2457	•	•	•	•
BS 3900-D6	•	•	•	
EN ISO 2813	•	•	•	
DIN 67530	•	•	•	
Metallic surfaces, mirror and glass 0 - max. 2000 GU				
EN ISO 7668	•	•	•	•

The reflectance of non-metallic surfaces increases with the angle of incidence. The reflective properties of metals do not always behave in this manner. Because of double reflection, the light is partially reflected on the coating and partially on the metal underneath. For a complete understanding of the reflective properties of such surfaces, it is recommended to measure them at all geometries.

Metallic surfaces and mirrors etc. with gloss values above 199,9 gloss units are measured with the new generation of gloss series ZGM 1110, ZGM 1120 and ZGM 1130 with automatic gloss range shift up to 2'000 GU. Alternatively, you can also use the ZGM 1023 series.

Geometry	20° Tappi	45° DIN	75° DIN	75° Tappi	75°
Application	Foil and paper industry				Leather, shagreen, porous surfaces
	high-gloss	high-gloss	low-gloss	low- to high-gloss	low-gloss
Standards					
EN/ISO 8254-1				•	
EN/ISO 8254-2			•		
EN/ISO 8254-3	•				
EN 14086		•			
DIN 54502		•	•		
Tappi T 480				•	
Tappi T 653	•				
Zehntner					•

9.3 How to choose the correct measuring geometry in the area of paint

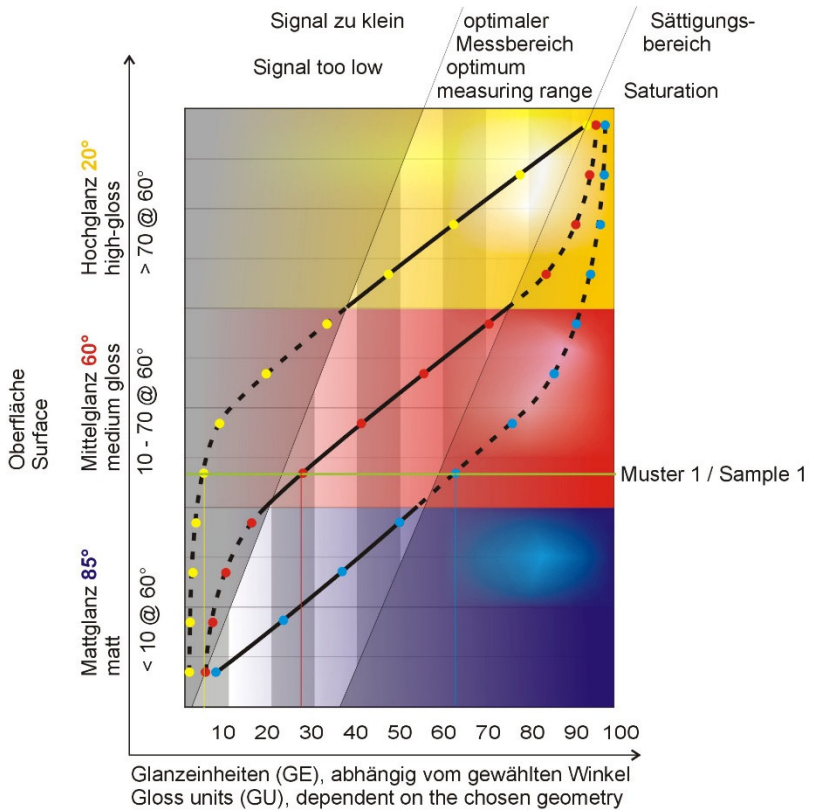
The following explanations apply to smooth coated surfaces, they do not fully apply for metallic and textured coatings or uneven surfaces. They do not apply at all for other surfaces such as foils, metals, textiles and paper.

According to the standard ISO 2813 and ASTM D 523 the correct measuring geometry should be determined by a pre-measurement taken at 60°. Related to that the correct measuring geometry can be determined with the table below.

ISO 2813		ASTM D 523	
Value @ 60°	Geometry	Value @ 60°	Geometry
>70 GU	20°	>70 GU	20°
30 GU – 70 GU	60°	10 GU – 70 GU	60°
<30 GU	85°	<10 GU	85°

The illustration below shows the relation between the gloss perception of visually equally classified coating samples (from matt to glossy) and the corresponding measures gloss values. Measuring values with the linear part of the curves ((highlighted by a fat continuous line) allow for better differentiation between the results. The curves cannot be generalized and cannot be used for converting gloss values of one measuring geometry into another.

Figure about how to choose the correct measuring geometry in the area of paint industry



In order to choose the correct geometry always make a pre-measurement with 60°. Measuring specimen 1 (green line) with 60° you will obtain approximately 28 GU. In this case the 60° is the correct measuring geometry.

If you obtain values less than 10 GU by a pre-measurement with 60°, you have to choose the 85° measuring geometry.

If you obtain values higher than 70 GU by a pre-measurement with 60°, you have to choose the 20° measuring geometry.

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