



GGU-ATTERBERG manual

Atterberg consistency limits (DIN 18122-1)

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Theorie. Und Praxis.

Geotechnische Softwarelösungen können so einfach sein. Denn Theorie und Praxis lassen sich mit **GGU-Software** und den neuen Angeboten der **civilserve Academy** prima kombinieren: Knackige theoretische Aufgaben lösen und als Sahnehäubchen Ihr

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1 GGU-ATTERBERG: Preface

The **GGU-ATTERBERG** program allows evaluation and visualisation of tests to determine consistency limits to DIN EN ISO 17892-12 or DIN EN ISO 14688-2. Liquid limit can be determined according to Casagrande or to the falling cone method. Select between DIN EN ISO 14688-2, DIN 18122, DIN 18196, ASTM and British Standard (BS 5930) for visualisation of the plasticity diagram.

The program includes convenient data input. The system is permanently displayed on the screen. Every change to the data is displayed on the screen, so that optimum control of the input data is guaranteed.

There are "?" and "Info" buttons in the dialog boxes for many technical and program-specific questions. Click on the "?" buttons or "Info" buttons to obtain the necessary information.

The graphic output supports the true type fonts provided by WINDOWS, so that an excellent layout is guaranteed. Colour output and numerous graphic formats (BMP, TIF, JPG etc.) are supported. PDF and DXF files can also be imported via the integrated **Mini-CAD** system (see "**Mini-CAD**" manual).

The program has been extensively tested. No errors have been found. Nevertheless, liability for completeness and correctness of the program and the manual, and for any damage resulting from incompleteness or incorrectness, cannot be accepted.

2 GGU-ATTERBERG: Licence protection

To protect the GGU software from unauthorised access, each GGU program is equipped with the **CodeMeter software protection system** from WIBU-Systems. Each GGU program is bound to a so-called **CmContainer** via a licence with the corresponding product code.

To be able to use the GGU licences in a CmContainer, a runtime environment, the **CodeMeter Runtime Kit**, must be installed on your computer via driver software. You can obtain the current version from [Software for Users - Wibu-Systems](#) (CodeMeter User Runtime for Windows).

You can work with the following CmContainer types on your PC with the CodeMeter Runtime Kit installed (= **CodeMeter licence server**):

- **CmStick**
The licence for your GGU program is stored in a USB dongle.
- **CmActLicense** (soft licence, not for virtual PC/servers)
The licence for your GGU program is stored in a licence file that is linked to the hardware of a computer.
- **CmCloudContainer**
The licence is located on a CmCloud server of WIBU-Systems and is mirrored to your CodeMeter licence server. The advantages of this type of licence binding are described on the following website: [Licence binding | GGU Software](#).

The GGU programs check at start-up and during runtime whether a corresponding license is available in a CmContainer.

3 GGU-ATTERBERG: Language selection

The GGU programs can be used in German and English. The program always starts with the language in which it was terminated.

The language preferences can be changed at any time in the "**Info**" menu, using the menu item "**Spracheinstellung**" (for German) or "**Language preferences**" (for English).

4 GGU-ATTERBERG: Starting the program

After starting the program, you will see two menus at the top of the window:

- File
- Info

After clicking on the "**File**" menu, a previously entered test can be loaded by means of the "**Load**" menu item, or a new one created using "**New**".

After clicking on "**File/New**" an empty form is shown on the screen. Five menus now appear at the top of the window:

- File
- Edit
- Graphics preferences
- Output preferences
- GGU-CONNECT
- Info

After clicking one of these menus, the so-called menu items roll down, allowing you access to all program functions.

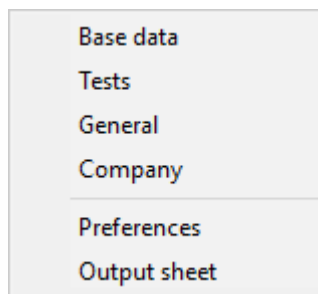
The program works on the principle of ***What you see is what you get***. This means that the screen presentation represents, overall, what you will see on your printer. In the last consequence, this would mean that the screen presentation would have to be refreshed after every alteration you make. For reasons of efficiency and as this can take several seconds for complex screen contents, the screen is not refreshed after every alteration.

If you would like to refresh the screen contents, press either [F2] or [Esc]. The [Esc] key also resets the screen display to your current image zoom, which is usually preset to 1.0, which corresponds to an A3 or A4 sheet in most GGU programs (see menu item "**Graphics preferences/Refresh and zoom**").

5 Tips and tricks

5.1 GGU-ATTERBERG: Keyboard and mouse

If you click the right mouse button anywhere on the screen a context menu containing the principal menu items opens.



By double-clicking the left mouse button on legends or **Mini-CAD** objects, the editor for the selected element immediately opens, allowing it to be edited.

If you double-click in the system graphics with the left mouse button you will see a message box with the results at the selected depth. This gives you a quick overview of the results for any desired depth.

In most dialog boxes, the buttons for leaving the box or buttons for decisive functions are marked thickly and can be reached by clicking the **[Enter]/[Return]** key.

In dialog boxes in which you have to make entries, e.g. change soil properties, the quickest way to jump to the next input box is to use the **[Tab]** key. The previous value is marked and can be overwritten directly with the new entry. You do not have to move to the box with the mouse and delete the old entry in advance.

In input boxes with numerical values, you can use the calculation operations listed in “**Tips and tricks: Mathematical functions in input boxes with numbers**” to change them.

You can scroll the screen with the keyboard using the cursor keys and the **[Page up]** and **[Page down]** keys. After activating the zoom functions, click on an area of the screen to enlarge or reduce the display by a factor of 2. Alternatively, by clicking and dragging the mouse while holding down the **[Ctrl]** key, you define a window section which is then displayed in full screen. By clicking and dragging the mouse while holding down the **[Shift]** and **[Ctrl]** keys, you zoom into your system graphic, i.e. you change the scale of your system representation.

You can also use the mouse wheel to zoom in or out or to move the screen display. When the program is started for the first time, the default setting for mouse wheel operation is activated according to Windows conventions:

- Mouse wheel up = move screen image up
- Mouse wheel down = move screen image down

- **[Shift]** + mouse wheel up = move screen image right
- **[Shift]** + mouse wheel down = move screen image left
- **[Strg]** + mouse wheel up = enlarge screen image (zoom in)

[Strg] + mouse wheel down = reduce screen image (zoom out)

From a zoomed representation you return to the full screen with **[Esc]**.

5.2 GGU-ATTERBERG: Function keys

Some of the function keys are assigned program functions. The allocations are noted after the corresponding menu items. The individual function key allocations are:

- **[Esc]** refreshes the screen content and resets the screen section to your current image zoom, which is preset to 1.0. This is useful, for example, if you have used the magnifying glass function to display sections of the drawing on the screen and want to quickly return to the overall view.
- **[F1]** opens the manual file.
- **[F2]** refreshes the screen without altering the current magnification.
- **[F11]** activates the menu item "**Move objects**", which appears in the GGU programs under various menu titles, e.g. "**Page size + margins**", "**Graphics preferences**" or "**Output preferences**".

5.3 GGU-ATTERBERG: Calculation operations in input boxes with numbers

In input boxes for numerical values, you can use the following arithmetic operations (also in combinations) to determine the desired value or to adjust the existing value. After pressing the **[Return]** or **[Enter]** key, the calculated value is inserted.

Function	Input
Add:	
5 + 12,18	5 + 12,18
Subtract:	
25,74 - 12,18	25,74 - 12,18
Multiply:	

$5,23 \cdot 4,18$	$5,23*4,18$
$\pi \cdot 2,5^3$	$PI*2,5^3$
Divide:	
$5,23 / 4,18$	$5,23/4,18$ or $5,23:4,18$
Exponentiate:	
25	2^5
Radify:	
Root of 27	$w(27)$ or $27^{(1/2)}$
5th root of 81,5	$81,5^{(1/5)}$
Sine, cosine, tangent etc.	
$\sin(32^\circ)$	$\sin(32)$
$\cos(5,23^\circ)$	$\cos(5,23)$
$\tan(45^\circ)$	$\tan(45)$
$\arctan(1,0)$	$\text{atan}(1,0) = 45^\circ$
Natural logarithm:	
$\ln(4,53)$	$\ln(4,53) = 1,5107$
Exponential function:	
$e^{1,5107}$	$\text{ep}(1,5107) = 4,53$

5.4 GGU-ATTERBERG: "Copy/print area" icon

A dialog box opens when the **"Copy/print area"** icon

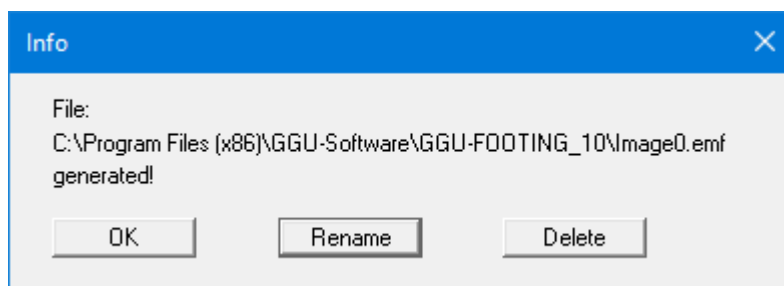


in the menu toolbar is clicked, describing the options available for this function. For example, using this icon it is possible to either copy areas of the screen graphics and paste them into the report, or send them directly to a printer.

In the dialog box, first select where the copied area should be transferred to: **"Clipboard"**, **"File"** or **"Printer"**. The cursor is displayed as a cross after leaving the dialog box and, keeping the left mouse button pressed, the required area may be enclosed. If the marked area does not suit your requirements, abort the subsequent boxes and restart the function by clicking the icon again.

If **"Clipboard"** was selected, move to the MS Word document (for example) after marking the area and paste the copied graphics using **"Edit/Paste"**.

If **"File"** was selected, the following dialog box appears after defining the area, shown here as an example for the **GGU-FOOTING** program:



The default location of the file is the folder from which the program is started (here: GGU-FOOTING_10) and, if several files are created, the file is given the file name **"Image0.emf"** with sequential numbering. If the

"Rename" button in the dialog box is clicked, a file selector box opens, and the copied area can be saved under a different name in a user-defined folder. Saving can be aborted by pressing the **"Delete"** button.

If the **"Printer"** button was pressed in the first dialog box, a dialog box for defining the printer settings opens after marking the area. Following this, a dialog box for defining the image output settings opens. After confirming the settings, the defined area is output to the selected printer.

6 File menu

6.1 GGU-ATTERBERG: "New" menu item

All input data will be deleted after a security request. After this, you can enter new tests.

6.2 GGU-ATTERBERG: "Load" menu item

You can load a file with test data, which was created and saved at a previous sitting, and then edit the test data.

6.3 GGU-ATTERBERG: "Save" menu item

You can save data entered or edited during program use to a file, to have them available at a later date, or to archive them. The data is saved without prompting with the name of the current file.

6.4 GGU-ATTERBERG: "Save as" menu item

You can save data entered during program use to an existing file or to a new file, i.e. using a new file name. For reasons of clarity, it makes sense to use **".ztd"** as file suffix, as this is the suffix used in the file requester box for the menu item **"File/Load"**. If you choose not to enter an extension when saving, **".ztd"** will be used automatically.

6.5 GGU-ATTERBERG: "Export as ASCII" menu item

The test data can be exported to an ASCII file, allowing processing in other applications.

6.6 GGU-ATTERBERG: "Output preferences" menu item

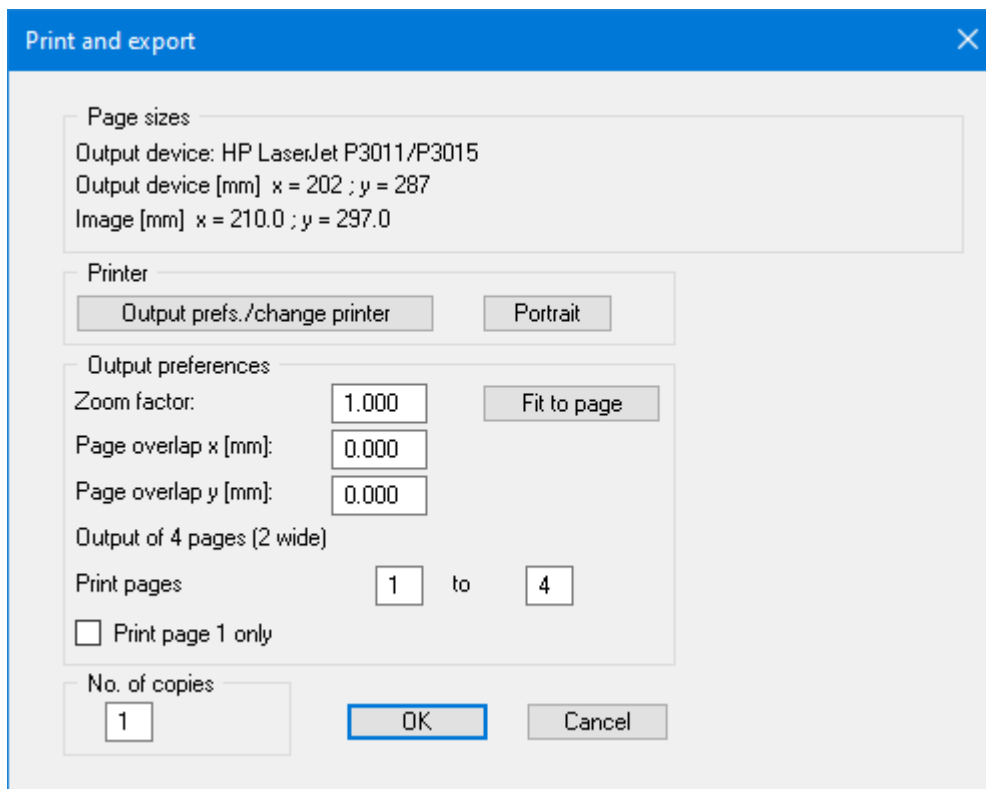
You can edit output preferences (e.g. swap between portrait and landscape) or change the printer in accordance with WINDOWS conventions.

6.7 GGU-ATTERBERG: "Print and export" menu item

You can select your output format in a dialog box. You have the following possibilities:

- **"Printer"**

allows graphic output of the current screen contents (*graphical representation*) to the WINDOWS standard printer or to any other printer selected using the menu item **"File/Output preferences"**. But you may also select a different printer in the following dialog box by pressing the **"Output prefs./change printer"** button.



In the upper group box, the maximum dimensions which the printer can accept are given. Below this, the dimensions of the image to be printed are given. If the image is larger than the output format of the printer, the image will be printed to several pages (in the above example, 4). To facilitate better re-connection of the images, the possibility of entering an overlap for each page, in x and y direction, is given.

Alternatively, you also have the possibility of selecting a smaller zoom factor, ensuring output to one page (**"Fit to page"** button). Following this, you can enlarge to the original format on a copying machine, to ensure true scaling. You can also print only the 1st page with zoom factor = 1.0, in which case the bottom left-hand area is printed. Furthermore, you may enter the number of copies to be printed.

- **"DXF file"**

allows output of the graphics to a DXF file. DXF is a common file format for transferring graphics between a variety of applications.

- **"GGU-CAD file"**

allows output of the graphics to a file, in order to enable further processing with the **GGU-CAD** program. Compared to output as a DXF file this has the advantage that no loss of colour quality occurs during export.

- **"Clipboard"**

The graphics are copied to the WINDOWS clipboard. From there, they can be imported into other WINDOWS programs for further processing, e.g. into a word processor. In order to import into any other WINDOWS program, you must generally use the *"Edit/Paste"* function of the respective application.

- **"Metafile"**

allows output of the graphics to a file in order to be further processed with third party software. Output is in the standardised EMF format (Enhanced Metafile format). Use of the Metafile format guarantees the best possible quality when transferring graphics.

If you select the **"Copy/print area"** tool



from the toolbar, you can copy parts of the graphics to the clipboard or save them to an EMF file. Alternatively you can send the marked area directly to your printer (see **"Tips and tricks"**).

Using the **"Mini-CAD"** program module you can also import EMF files generated using other GGU applications into your graphics (see menu item **"Graphics preferences/Mini-CAD"**).

- **"Mini-CAD"**

allows export of the graphics to a file in order to enable importing to different GGU applications with the **Mini-CAD** module.

- **"GGUMiniCAD"**

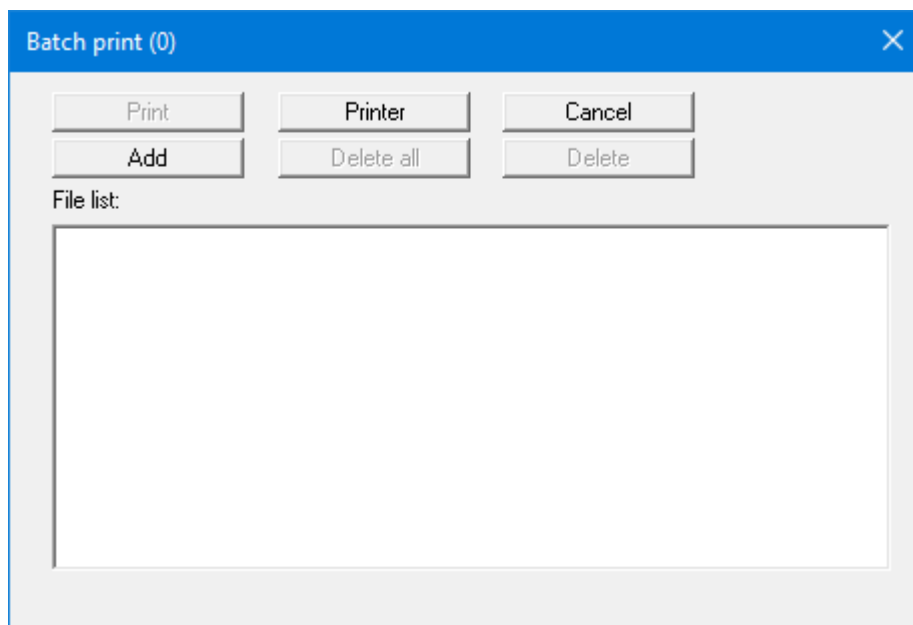
allows export of the graphics to a file in order to enable processing in the **GGUMiniCAD** program.

- **"Cancel"**

Printing is cancelled.

6.8 GGU-ATTERBERG: "Batch print" menu item

If you would like to print several appendices at once, select this menu item. You will see the following dialog box:



Create a list of files for printing using **"Add"** and selecting the desired files. The number of files is displayed in the dialog box header. Using **"Delete"** you can mark and delete selected individual files from the list. After selecting the **"Delete all"** button, you can compile a new list. Selection of the desired printer and printer preferences is achieved by pressing the **"Printer"** button.

You then start printing by using the **"Print"** button. In the dialog box which then appears you can select further preferences for printer output such as, e.g., the number of copies. These preferences will be applied to all files in the list.

6.9 GGU-ATTERBERG: "Exit" menu item

After a confirmation prompt, you can quit the program.

6.10 GGU-ATTERBERG: "1, 2, 3, 4" menu items

If you have not stored a working directory for the program icon, the program jumps to the program directory after starting to load or save a file.

Under the menu items of the File menu, the most recently edited files are listed with the respective storage path ("**1, 2, 3, ...**"). Selecting one of these files loads the selected file. The next time the **"File/Load"** or **"File/Save"** menu items are called up in the same program session, the program automatically jumps to the directory of the last file loaded.

7 Edit menu

7.1 GGU-ATTERBERG: "Base data" menu item

After selecting this menu item, the following dialog box appears:

Base data

Preferences

Liquid limit determination to: Casagrande

☐ Use designations according to ÖNORM B 4411

☒ Consistency according to DIN EN ISO 14688-2

Plasticity diagram according to: DIN 18196:2023

Natural water content w_n of sample

w_n [%] = 0.00

Shrinkage limit w_s of sample

w_s [%] = 0.00 ?

Oversize

☒ Over-coarse grain to DIN EN ISO 17892

Mass of undried sample [g] = 0.00

Dry mass of removed particles [g] = 0.00

Oversize component [%] = 0.00

Oversize water content [%] = 0.00

Max. permissible grain [mm] = 0.4 mm

Empirical formula

☐ Determine plastic limit with empirical formula

$w_p = (0.864 * w_L - 0.075) * w_L$

Machine correction

☐ Plastic limit determined with machine

$w_p = w_p' / \alpha + \beta$

α [-] = 1.0000

β [-] = 0.0000

OK Cancel

Liquid limit can be determined via evaluation to Casagrande or to the falling cone method (60g/60° or 80g/30°). You can specify whether to use the **ÖNORM B 4411** designations on the output sheet. By activating the appropriate check box when evaluating the consistency, evaluation can be performed according to the new **DIN EN ISO 14688-2**.

Select from various standards for plasticity diagram visualisation using the arrow of the drop-down list.

DIN 18 122
ASTM
BS 5930
DIN EN ISO 14688-2 2018
DIN 18196:2023

The **DIN EN ISO 14688-2** visualisation is used by default; however, it is also possible to select visualisation according to the requirements of the **DIN 18122**, **DIN 18196** or the **ASTM (A*merican Society for Testing and Materials)**. *In addition, visualisation according to the requirements of BS 5930 (British S*tandard, 1999 edition) is also possible.*

Enter the natural water content of the sample, the shrinkage limit and, if available, the oversize grain component and its water content (each in %) into the following four data boxes.

It is also possible to determine the plastic limit using an empirical equation. If this check box is activated, it is not necessary to enter data for the plastic limit. The plastic limit is then determined from the liquid limit by means of the given equation. The equation used should be treated with caution.

If you have determined the plastic limit using a machine, you activate the "**Plastic limit determined with machine**" check box. Additionally, a machine-dependent corrections "**alpha**" and "**beta**" can be entered.

7.2 GGU-ATTERBERG: "Tests" menu item

This point represents the program's central menu item. Almost all the test data are entered here. As an example, after clicking this menu item the following dialog box opens for activated liquid limit determination after Casagrande:

Tests

Operations

Done Cancel Sort 7 Tests to edit

Show base data Show test data Delete single test

Info

Number of blows <= 0 --> enter values for plastic limit Switch to container input from database

Data

No.	Number of Blows	Wet sample + container [g]	Dry sample + container [g]	Container [g]	Single result
1	33	157.42	142.09	86.25	?
2	23	152.83	137.89	84.94	?
3	18	141.26	126.33	74.74	?
4	14	158.66	141.31	83.53	?
5	-1	59.82	59.03	54.79	?
6	-1	63.56	62.83	58.55	?
7	-1	61.75	60.82	55.84	?

Seven tests are already present in this example. The following buttons can be used in the "Actions" group box:

- **"Done"/"Cancel"**

You will arrive back at the menu bar with or without accepting any changes

- **"Sort"**

The tests can be sorted according to the number of blows or penetration depths.

- **"x Tests to edit"**

You can change the number of tests. A new single test will be generated at the end of the list allowing subsequent data input (see below). Reducing the number of tests will delete the single test at the end of the list.

- **"Show base data"**

The test data corresponding to any entered single tests are computed and displayed in a message box. The same data are shown on the output sheet in the **"Water content, etc."** element (see **"Output preferences/Water content"** menu item).

- **"Show test data"**

The water content data for the tests will be calculated and displayed, together with all input data. The test data can also be shown on the output sheet in table format if the corresponding element is activated (see **"Output preferences/Table"** menu item).

- **"Delete single test"**

Select the number of the single test to be deleted in the dialog box.

- **"?"**

Using the "?" button behind every input row the input data and test results corresponding to the single test are displayed in a message box.

If you use containers with standard weights for your tests it is recommended to store the weights of the respective containers in a database. This saves repeated input by hand. The database can be stored using the menu item **"Edit/Container database"**.

The container database can also be accessed when using other GGU laboratory programs.

In the lower **"Data"** group box, enter the number of blows for the new single test, together with the weights of the sample and container for determining the water content. If you enter a blow count of "0" or a negative value, this will designate a test for determination of the plastic limit. Otherwise, the following data will be used for liquid limit determination. The weight of the test container can be entered manually or be selected from a database. To do this, use the **"Switch to container input from database/Switch to container input 'By hand'"** button (see above).

If only one individual test is entered for liquid limit determination, the program will evaluate with the one-point method in accordance with DIN EN ISO 17892-12. In the blow diagram, only one value is displayed, without a best-fit line. Additionally, a note is given in the diagram that this was a one-point test.

The evaluation of the plastic limit is in accordance with the notes in DIN EN ISO 17892-12. If, after this criterion has been applied, less than three tests remain for determination of the plastic limit, a warning message will be given. For machine determination of the plastic limit, this warning message is suppressed.

The results for the corresponding single tests are calculated and displayed in a message box by clicking the "?" button following the tests.

If you have activated liquid limit determination using a falling cone method in **"Edit/Base Data"**, you will see a customised dialog box for test input.

No.	Penetr. depth [mm]	Wet sample + container [g]	Dry sample + container [g]	Container [g]	Single result
-----	--------------------	----------------------------	----------------------------	---------------	---------------

Here, enter the penetration depth in [mm] in place of the number of blows. Here, too, the following applies: If you enter a penetration depth of "0" or a negative value, this will designate a test for determination of the plastic limit.

7.3 GGU-ATTERBERG: "Delete all tests" menu item

After a security request, all tests will be deleted. After this, you can enter a new test using the **"Edit/Tests"** menu item.

7.4 GGU-ATTERBERG: "Test data input via editor" menu item

Beside the test data input described above, where the water content is determined by the program, test data can also be entered directly in an editor. The following dialog box opens after a confirmation prompt:

No.	Number of Blows	w [%]
-----	-----------------	-------

First select the "**x values to edit**" button and enter the number of values to be edited (e.g. "**3**"). According to the selected liquid limit determination method you can then enter the three value pairs (blow count or penetration depth and corresponding water content). Here too, a blow count or penetration depth of 0 designates a plastic limit. After selecting the "**Done**" button, the test results will be graphically displayed.

The dialog box shows a maximum of 8 value pairs simultaneously. If more than 8 value pairs have been entered, you can move through the table with the "**Forw.**" and "**Back**" buttons. Existing data pairs can be deleted from the end of the list by reducing the number of entries, but a minimum of two data pairs must remain. The data pairs entered using this menu item are deleted following a confirmation prompt when you go to the menu item "**Edit/Tests**" for a second time.

7.5 GGU-ATTERBERG: "General" menu item

Go to this menu item to enter general data such as the project identification, report number, annex number, etc. This data is displayed in the correct elements of the output sheet.

General	
Project (1st line):	Example City
Project (2nd line):	123 For Instance Road
Project (3rd line):	
Edited by:	Otto
Edit date:	2018-03-02
Test number:	
Sampling point:	B1
Depth:	2.0 - 2.3 m
Type of sampling:	disturbed
Soil type:	T, u'
Date of sampling:	2018-05-02
Report:	2018
Annex:	3
OK Cancel	

The marked texts in the dialog box also appear in the output sheet. Input boxes can be altered or switched off such as "**Test number:**" as shown in the above dialog box by going to the menu item "**Output preferences/Texts**".

7.6 GGU-ATTERBERG: "Company" menu item

You can enter your company address in four lines. These lines will be entered at the top left of the form.

7.7 GGU-ATTERBERG: "Container database" menu item

If you use containers with standard weights for your tests, their weights can be stored in a container database using the dialog box in this menu item.

No.	Name	Weight [g]	Volume [cm³]
1	Nr. 1	84.65	813.000
2	Nr. 2	81.40	768.000
3	Nr. 3	83.75	795.000

Enter the number of containers to be defined via the "**x containers to edit**" button. The corresponding number of rows for input will then be shown. If more than 8 containers are defined you can navigate through the list using the "**Forw.**" and "**Back**" buttons.

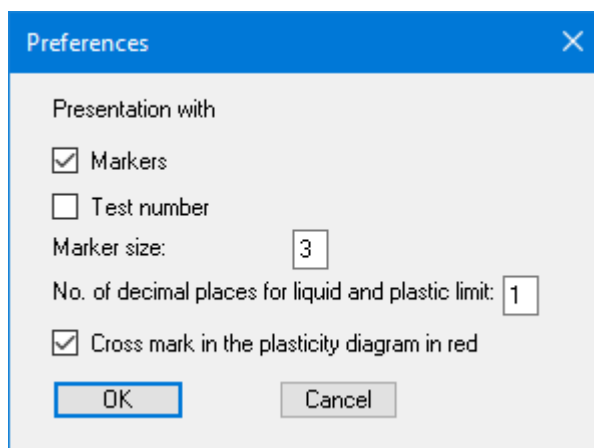
If you work with several databases, you can save the containers to a database or load a different database using the appropriate buttons. The database file is first searched for in the program folder, then at the working level and finally in the Windows folder. It is generally practical to store the container database in the Windows folder if it is also to be accessed by other GGU laboratory programs. If the database file is saved using the default name of "**GGU-Database.bh_**" it is automatically loaded when the program starts. This information is also stored behind the "**Info**" button.

The containers stored in the database can be accessed in a drop-down combo box in the menu item "**Edit/Tests**".

8 Graphics preferences menu

8.1 GGU-ATTERBERG: "Preferences" menu item

After selecting this menu item, a dialog box appears, in which you can edit preferences for graphical visualisation.



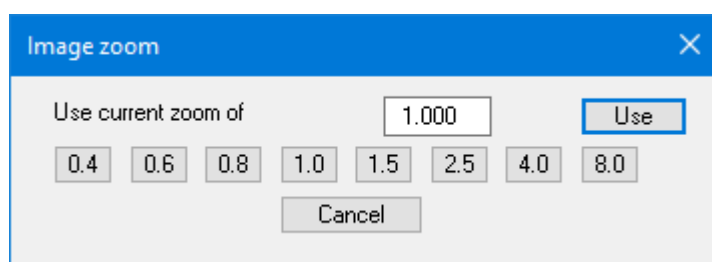
Activating the corresponding check boxes you decide whether markers or test numbers are to be entered at the blow diagram points. If neither of the two check boxes is selected, the values will not be marked. The marker size is user-defined.

Furthermore, you can also define an output with 2 decimal places for liquid and plastic limit as well as highlight the measuring point by a red cross mark in the plasticity diagram.

8.2 GGU-ATTERBERG: "Refresh and zoom" menu item

The program works on the principle of ***What you see is what you get***. This means that the screen presentation represents, overall, what you will see on your printer. In the last consequence, this would mean that the screen presentation would have to be refreshed after every alteration you make. For reasons of efficiency and as this can take several seconds for complex screen contents, the screen is not refreshed after every alteration.

If, e.g., after using the zoom function (see below), only part of the image is visible, you can achieve a complete view using this menu item.



A zoom factor between 0.4 and 8.0 can be entered in the input box. By then clicking on "Use" to exit the box the current factor is accepted. By clicking on the "0.4", "0.6", etc. buttons, the selected factor is used directly, and the dialog box closed.

It is much simpler, however, to get a complete overview using [Esc]. Pressing [Esc] allows a complete screen presentation using the zoom factor specified in this menu item. The [F2] key allows screen refreshing without altering the coordinates and zoom factor.

8.3 GGU-ATTERBERG: "Zoom info" menu item

An info box informs you about the activation and options of the zoom function.

The quickest way to enlarge a specific section of the screen is to open a zoom window by holding down the [Ctrl] key and the mouse button.

8.4 GGU-ATTERBERG: "Legend font selection" menu item

With this menu item you can switch to a different true-type font. All available true-type fonts are displayed in the dialog box.

8.5 GGU-ATTERBERG: "Font size selection" menu item

You can edit font sizes of texts [in mm] within the various input areas.

8.6 GGU-ATTERBERG: "Mini-CAD toolbar" menu item

Using this menu item you can add free text, lines, circles, polygons and images (e.g. files in formats BMP, JPG, PSP, TIF, etc.) to the main program graphics. PDF files can also be imported as images. A pop-up menu opens, the icons and functions used are described in more detail in the [Mini-CAD manual](#).

Drawing objects that you create with this **Mini-CAD** system refer to the page format (in mm). You should therefore select this menu item if you wish to enter additional information on the system.

These objects can be saved in a ".mcd" file using the icon



in the pop-up menu and loaded as such in other GGU programs using the icon



in the pop-up menu.

8.7 GGU-ATTERBERG: "Toolbar preferences" menu item

After starting the program, a horizontal toolbar for menu items appears below the program menu bar. If you would rather work with a popup window with several columns, you can specify your preferences using this menu item. The smart icons can also be switched off.

At the bottom of the program window, you find a status bar with further information. You can also activate or switch off the status bar here. The preferences will be saved in the "**GGU-ATTERBERG.alg**" file (see menu item "**Graphics preferences/Save graphics preferences**") and will be active at the next time the program is started.

By clicking on the tools (smart icons) for the menu items you can directly reach most of the program functions. The meaning of the smart icons appears as a text box if you hover with the mouse pointer over the tools. Some of the tool functions cannot be called up via normal menu titles and menu entries.

Not all of the icons described below are available in all GGU programs.



"Next page"/"Previous page"

You can use these icons to scroll forwards and backwards between individual pages. In many GGU programs, you can use this in the **output table representation**.



"Select page" or "Diagram/Output table"

If you are in the **output table representation**, you can use this symbol to jump to a specific page or switch back to the normal display, i.e. your graphic display.



"Zoom out"

If you have previously zoomed in, this tool returns to a full screen display.



"Zoom (-)"/"Zoom (+)"

With the zoom functions you can zoom in or out of parts of the image, by clicking the left mouse button.



"Copy/print area"

Use this tool to copy only parts of the graphics in order to paste them, e.g. to a report. You will see information on this function and can then mark an area, which is copied to the clipboard or can be saved in a file. Alternatively, you can send the marked area directly to your printer (see "**Tips and tricks**").

**"Colour on/off" or "Colour/hatching"**

If you want to remove the colour from the system display, e.g. to create a black and white printout, you can do this using this on/off switch.

In several GGU programs, 4 colour and hatching settings are possible via this icon, which you can click through in sequence. A colour filled representation is the default setting, the next click shows the hatching, then coloured and hatched. The fourth click shows a representation with neither colour nor hatching. The next click starts again.

**"Move object"**

Use this icon to position legends and diagrams at the desired position on the output sheet.

**"Undo move object"**

By clicking this icon the last performed movement of graphical elements made using the [F11] function key or the menu item **"Output preferences/Move objects"** can be undone.

**"Restore move object"**

By clicking this symbol, the last object movement undo carried out using "Undo move object" can be restored.

**"Construction phase back"/"Construction phase forward"**

If you are in the display of construction phases, you can use these icons to scroll back and forth between the individual construction phases.

8.8 GGU-ATTERBERG: "Load graphics preferences" menu item

You can reload a graphics preferences file into the program, which was saved using the **"Graphics preferences/Save graphics preferences"** menu item. Only the corresponding data will be refreshed.

8.9 GGU-ATTERBERG: "Save graphics preferences" menu item

Some of the preferences you made with the menu items of the "**Graphics preferences**" menu as well as the inputs using the "**Edit/Company**" menu item can be saved to a file. If you select "**GGU-ATTERBERG.alg**" as file name and save the file on the same level as the program, the data will be automatically loaded the next time the program is started and need not be entered again.

If you do not go to "**File/New**" upon starting the program, but open a previously saved file instead, the preferences used at the time of saving are shown. If subsequent changes in the general preferences are to be used for existing files, these preferences must be imported using the menu item "**Graphics preferences/Load graphics preferences**".

9 Output preferences menu

9.1 GGU-ATTERBERG: General note on output preferences

The DIN 18122 makes no suggestions for presentation of test results. It has become common practice, however, to use the following presentations:

- Blow diagram;
- Text with test results (water content etc.);
- Consistency;
- Plasticity range;
- Plasticity diagram.

In addition to these elements, which are relevant to test evaluation only, further elements are also used in the visualisation:

- Title;
- Company;
- Test no., etc.;
- Annex and report;
- Table.

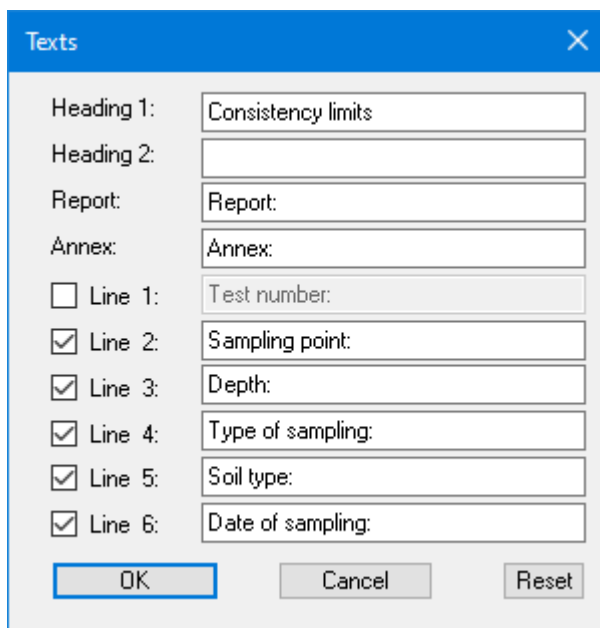
The output sheet can be completely redesigned using the items in this menu.

9.2 GGU-ATTERBERG: "Page size" menu item

When you start the program, the default setting is a DIN A4 sheet in portrait format. You can adjust the sheet format to your requirements in the dialog box.

9.3 GGU-ATTERBERG: "Texts" menu item

The default labelling of some output sheet elements can be edited in this menu item's dialog box. Among other things, the name of the output sheet can be specified here.

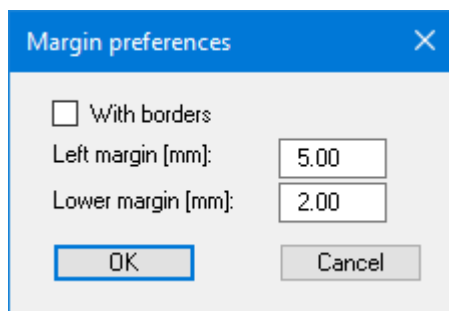


Your input in rows 1 to 6 of the above dialog box, as well as the input for "**Report:**" and "**Annex:**" also represent the designations for the input boxes in the "**Edit/General**" menu item dialog box. If lines are deactivated in the above dialog box, the corresponding input boxes in the "**Edit/General**" menu item dialog box are also deactivated.

Use "**Reset**" to restore the default labelling settings. If you have retroactively changed the language, you will see the internal program translations in the input boxes.

9.4 GGU-ATTERBERG: "Margins" menu item

In the default program preferences, the form is shown with cutting borders. For output to an A4 printer, a reduction of the printer output is generally necessary, as proprietary printers cannot fully cover an A4 page. The margin preferences can be defined in the following dialog box.



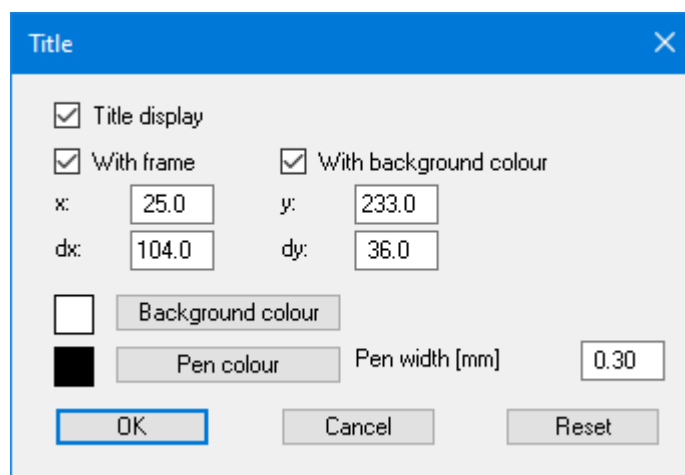
By deactivating the "**With borders**" check box and with an appropriate choice of left and lower margins, it is generally possible to create a non-reduced printer output. It is necessary to also adapt the page height and width (see menu item "**Output preferences/Page size**").

9.5 GGU-ATTERBERG: "Position info" menu item

The positions and layout of the individual elements on the output sheet can be altered using the following menu items. This menu item provides information on the options for altering the position and layout more quickly using the mouse.

9.6 GGU-ATTERBERG: "Title (change position)" menu item

The position and layout of the title element can be altered via the dialog box for this menu item, if the **"Title display"** check box is activated.



The position of the element on the output sheet and its size can be defined or edited by means of the variables **"x"** and **"y"**, **"dx"** and **"dy"**. The element can be provided with a frame and a background colour to suit your personal requirements. If the element needs to be returned to its original condition, this can be done using the **"Reset"** button. Alternatively, you can alter the size and shape of the element using the mouse (see menu item **"Output preferences/Move objects"**).

The heading **"Consistency limits"** shown in the title element can be edited in the menu item **"Output preferences/Texts"**. The texts **"Project (1st line)"** to **"Project (3rd line)"** are entered immediately after double-clicking the element or using the menu item **"Edit/General"**.

9.7 GGU-ATTERBERG: "Plasticity diagram" menu item

You will see an almost identical dialog box with the same settings options as described in the menu item **"Output preferences/Title (change position)"**. Proceed as described there if you want to make changes to the position or layout of the element in this menu item.

9.8 GGU-ATTERBERG: "Company" menu item (output)

You will see an almost identical dialog box with the same settings options as described in the menu item **"Output preferences/Title (change position)"**. Proceed as described there if you want to make changes to the position or layout of the element in this menu item.

The input for this element can be edited immediately after double-clicking on the element or via the menu item **"Edit/Company"**.

9.9 GGU-ATTERBERG: "Test no., etc." menu item

You will see an almost identical dialog box with the same settings options as described in the menu item **"Output preferences/Title (change position)"**. Proceed as described there if you want to make changes to the position or layout of the element in this menu item.

The input for this element can be edited immediately after double-clicking on the element or via the menu item **"Edit/General"**. For this element you also have the option of adapting the texts in front of the input boxes to suit your needs. Go to the menu item **"Output preferences/Texts"**.

9.10 GGU-ATTERBERG: "Annex and report" menu item

You will see an almost identical dialog box with the same settings options as described in the menu item **"Output preferences/Title (change position)"**. Proceed as described there if you want to make changes to the position or layout of the element in this menu item.

The input for this element can be edited immediately after double-clicking on the element or via the menu item **"Edit/General"**. For this element you also have the option of adapting the texts in front of the input boxes to suit your needs. Go to the menu item **"Output preferences/Texts"**.

9.11 GGU-ATTERBERG: "Plasticity range" menu item

You will see an almost identical dialog box with the same settings options as described in the menu item **"Output preferences/Title (change position)"**. Proceed as described there if you want to make changes to the position or layout of the element in this menu item.

9.12 GGU-ATTERBERG: "Blow diagram" menu item

You will see an almost identical dialog box with the same settings options as described in the menu item **"Output preferences/Title (change position)"**. Proceed as described there if you want to make changes to the position or layout of the element in this menu item.

9.13 GGU-ATTERBERG: "Consistency" menu item

You will see an almost identical dialog box with the same settings options as described in the menu item **"Output preferences/Title (change position)"**. Proceed as described there if you want to make changes to the position or layout of the element in this menu item.

9.14 GGU-ATTERBERG: "Water content etc." menu item

You will see an almost identical dialog box with the same settings options as described in the menu item **"Output preferences/Title (change position)"**. Proceed as described there if you want to make changes to the position or layout of the element in this menu item.

9.15 GGU-ATTERBERG: "Table" menu item

This element is hidden in the default program setting. The test and result data of all single tests are given in the table.

You will see an almost identical dialog box with the same settings options as described in the menu item **"Output preferences/Title (change position)"**. Proceed as described there if you want to make changes to the position or layout of the element in this menu item.

9.16 GGU-ATTERBERG: "Reset all" menu item

With this button, all preferences for the aforementioned elements, which may have been edited with the previous menu item, will be reset to the program defaults.

9.17 GGU-ATTERBERG: "Move objects" menu item

If you select this entry, you can then use the mouse to move the various objects and legends. Move the mouse over the object of your choice. If you are over a movable object, the mouse pointer will take on the shape of a cross. Now press the left mouse button and drag the object to the desired position while holding down the button.

After going to this menu item **only one object** at a time can be moved using the mouse or its size be altered.

If you want to edit several objects, you can also activate the function more quickly by pressing the **[F11]** key or the symbol



. An info box will then no longer appear.

In many GGU programs you can also alter the size of an object using this menu item or the **[F11]** function key. If you are positioned over the frame of a resizable object after activating the function, the mouse takes on the shape of a double arrow. Hold down the left mouse button and drag the frame until the object has reached the desired size. Drag a corner to maintain the aspect ratio of the sides. If you drag on one side, the object becomes taller or wider.

Using the **[Back]** key or by clicking on the icon



you can undo the last change to the position or size of an object.

In programs in which you can position the diagrams yourself (menu item "**System/Graph positioning preferences**"), the result diagrams can also be moved using this function if you have switched to "**Manual graph positioning**".

10 GGU-CONNECT menu

10.1 GGU-ATTERBERG: "Info" menu item

You will receive a short information about the new **GGU-CONNECT** program, which enables the organisation of geotechnical data.

10.2 GGU-ATTERBERG: "CONNECT IDs" menu item

For the interaction of the GGU programs with **GGU-CONNECT**, all elements (in **GGU-STRATIG**, for example, each drilling profile, each dynamic probing etc.) are assigned a so-called **CONNECT ID**.

This **CONNECT ID** is assigned when a file is saved or imported into **GGU-CONNECT**.

Therefore, if you open a previously saved file or import data from **GGU-CONNECT**, the **CONNECT ID** is displayed in an info box, for example for a drilling profile in **GGU-STRATIG**:



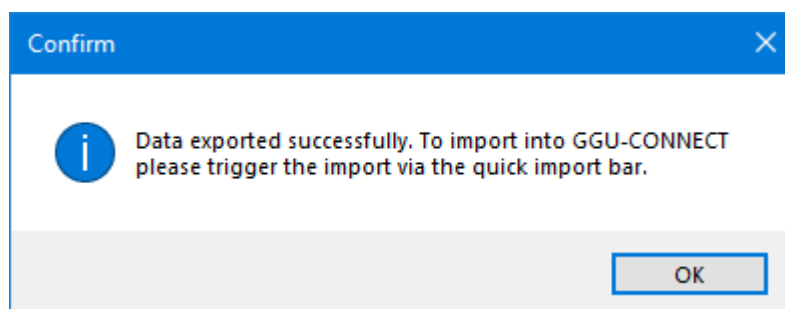
You can delete these IDs by clicking on the **"Reset CONNECT IDs"** button. If, for example, you copy and change a drilling profile to which a **CONNECT ID** has already been assigned, this ID would otherwise exist twice. The next time you save or import into **GGU-CONNECT**, the profiles will be assigned a new **CONNECT ID**.

10.3 GGU-ATTERBERG: "Import data from GGU-CONNECT" menu item

You can use this menu item to import data (e.g. for a drilling profile) that you have already saved in **GGU-CONNECT** into this program and edit it further.

10.4 GGU-ATTERBERG: "Export data to GGU-CONNECT" menu item

Once you have entered and, if necessary, analysed your data, you can copy the data to the Windows clipboard by clicking on this menu item and then add it to your project in **GGU-CONNECT**. You will receive the following message:



11 Info menu

11.1 GGU-ATTERBERG: "Copyright" menu item

You will see a copyright message and information on the program version number.

The "**System**" button shows information on your computer configuration and the folders used by the GGU program.

11.2 GGU-ATTERBERG: "Maxima" menu item

Here you can check the defaults for maximum values of the program.

11.3 GGU-ATTERBERG: "Help" menu item

The manual is opened as a PDF document. The help function can also be accessed using the **[F1]** function key.

11.4 GGU-ATTERBERG: "GGU on the web" menu item

Using this menu item, you can access the [GGU Software website](#).

Check the page of your program module at regular intervals for information about updates and changes. On the "**Changelogs**" subpage, you can also subscribe to an e-mail notification that informs you of all changes on a monthly basis.

11.5 GGU-ATTERBERG: "GGU support" menu item

This menu takes you directly to the [GGU Software Support Portal](#).

Here you can enter your support request directly and upload your edited GGU program file.

11.6 GGU-ATTERBERG: "What's new?" menu item

You will see information on program improvements in comparison to older versions.

11.7 GGU-ATTERBERG: "Language preferences" menu item

This menu item allows you to switch the menus and the graphics from German to English and vice versa. To work in German, deactivate the two check boxes "**Dialoge + Menüs übersetzen (translate dialogues, menus)**" und "**Graphiktexte übersetzen (translate graphics)**".

Alternatively, you can work bilingually, e.g. with German dialog boxes but with graphic output in English. The program always starts with the language setting applicable when it was last ended.