

GGU-COMPACT manual

Proctor compaction tests (DIN 18127)

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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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vertiefen!**

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1 GGU-COMPACT: Preface

The **GGU-COMPACT** program system allows evaluation and visualisation of Proctor compaction tests according to German Standard DIN 18127

Beside visualisation of the current Proctor compaction test, it is possible to visualise up to 15 further tests respectively their Proctor curve using the "**Special**" menu. A legend is shown for these tests (henceforth known as **extra tests**), allowing allocation of a line type to the test designations. For example, boundary curves can be entered via the extra tests.

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-COMPACT: Licence protection

2 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-COMPACT: 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-COMPACT: Starting the program

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

File

Info

After clicking the "**File**" menu, either an existing file can be loaded by means of the "**Load**" menu item, or new tests can be entered using "**New**". After clicking "**File/New**" an empty form is displayed on the screen. Then, the menu bar will show six menus:

File

Edit

Graphics preferences

Output preferences

Special

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-COMPACT: Keyboard and mouse

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-COMPACT: 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**".

In this GGU program, the following function keys are also assigned to program functions:

5.3 GGU-COMPACT: "Copy/print area" icon

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

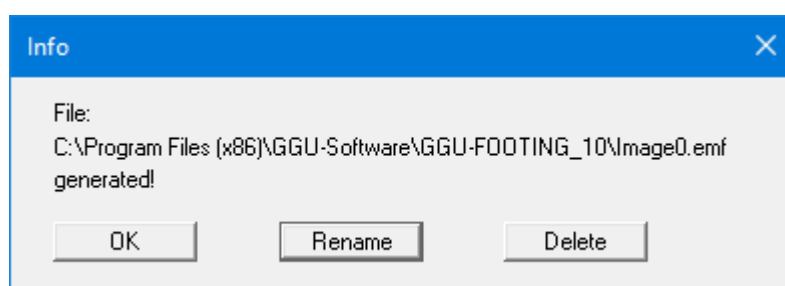


in the menu toolbar is clicked, describing the options available for this function. For example, using this icon it is possible to either copy areas of the screen graphics and paste them into the report, or send them directly to a printer.

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-COMPACT: "New" menu item

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

6.2 GGU-COMPACT: "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-COMPACT: "Save" menu item

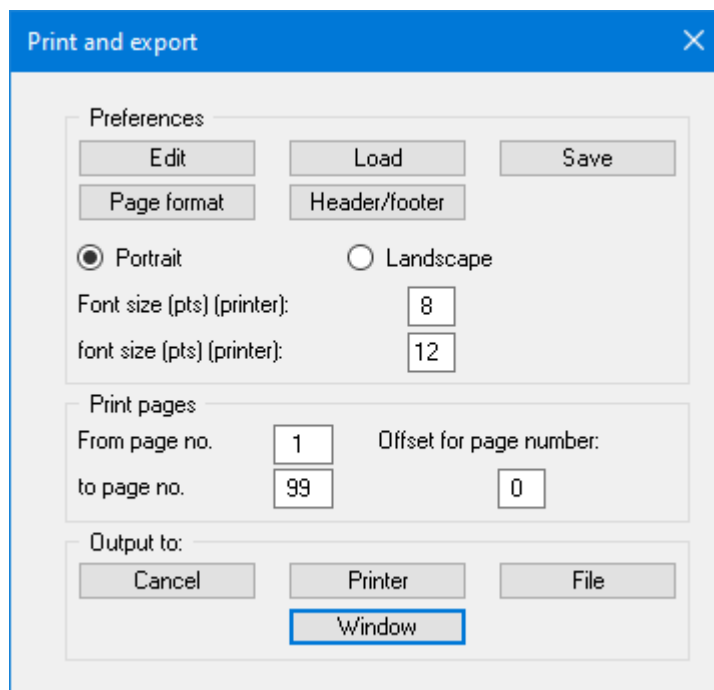
You can save data entered or edited during program use to a file, to have them available at a later date, or to archive them. The data is saved without prompting with the name of the current file.

6.4 GGU-COMPACT: "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 **".prc"** 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, **".prc"** will be used automatically.

6.5 GGU-COMPACT: "Print 'simple' output table" menu item

You can have your analysis data sent to the printer, without further work on the layout, or save it to a file for further processing using a different program, e.g. a word processing application.



In the dialog box you can define output preferences.

- **"Output preferences"** group box

Using the **"Edit"** button the current output preferences can be changed or a different printer selected.

Using the **"Save"** button, all preferences from this dialog box can be saved to a file in order to have them available for a later session. If you select the program name with the extension **".drk"** as the file name and save this file at program level (default setting), this file will be loaded automatically the next time the program is started.

Using the **"Page format"** button you can define, amongst other things, the size of the left margin and the number of lines per page. The **"Header/footer"** button allows you to enter a header and footer text for each page. If the **"#"** symbol appears within the text, the current page number will be entered during printing (e.g. **"Page #"**). The text size is given in **"Pts"**. You can also change between **"Portrait"** and **"Landscape"** formats.

- **"Print pages"** group box

If you do not wish pagination to begin with **1** you can add an offset number to the check box. This offset will be added to the current page number. The output range is defined using **"From page no."** **"to page no."**.

- "Output to:" group box

Start output by clicking on "Printer" or "File". The file name can then be selected from or entered into the box. If you select the "Window" button the results are sent to a separate window. Further text editing options are available in this window, as well as loading, saving and printing.

6.6 GGU-COMPACT: "Export to ASCII" menu item

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

6.7 GGU-COMPACT: "Output preferences" menu item

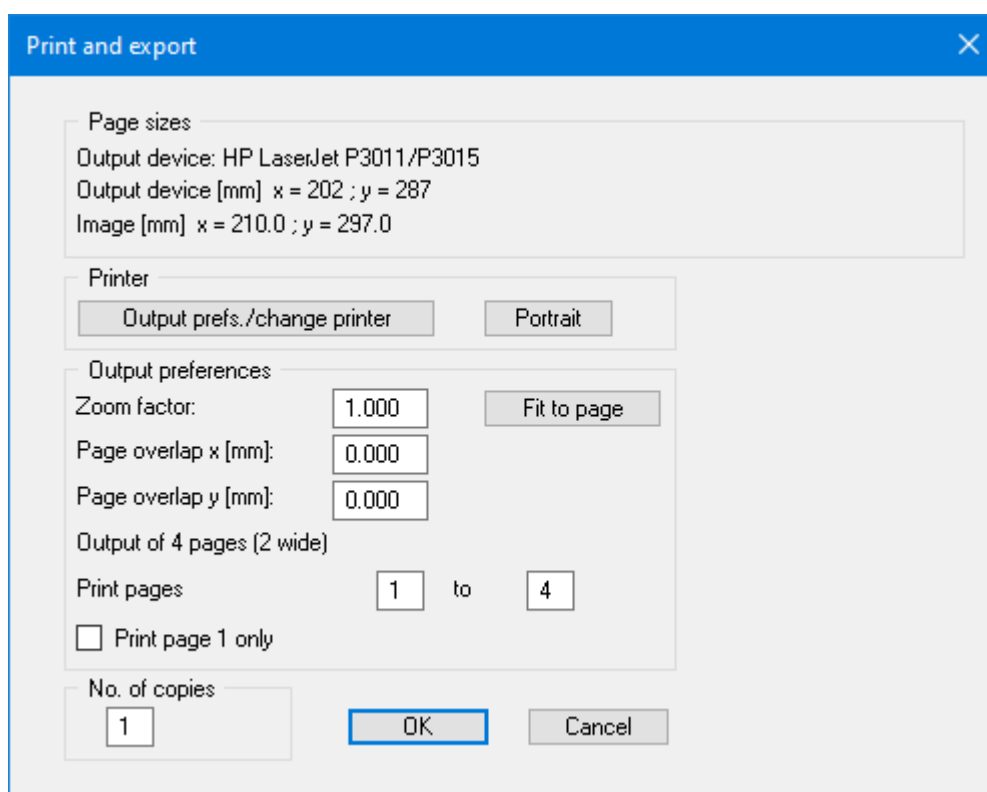
You can edit output preferences (e.g. swap between portrait and landscape) or change the printer in accordance with WINDOWS conventions.

6.8 GGU-COMPACT: "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



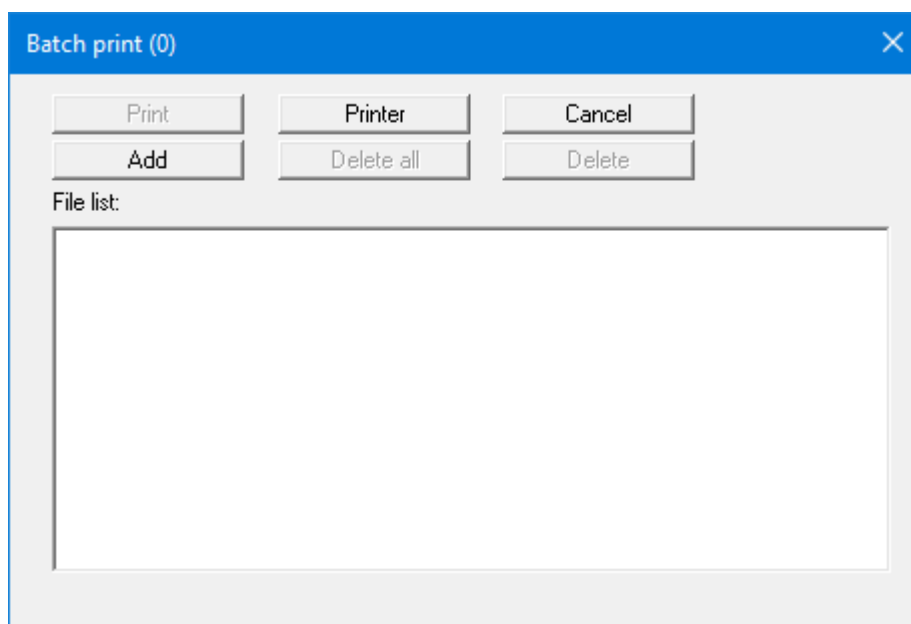
from the toolbar, you can copy parts of the graphics to the clipboard or save them to an EMF file. Alternatively you can send the marked area directly to your printer (see "**Tips and tricks**").

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.

6.9 GGU-COMPACT: "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.

6.10 GGU-COMPACT: "Exit" menu item

After a confirmation prompt, you can quit the program.

6.11 GGU-COMPACT: "1, 2, 3,..." menu items

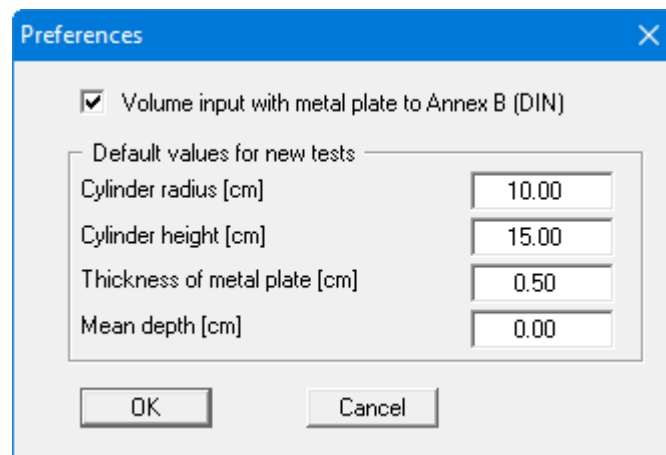
If you have not stored a working directory for the program icon, the program jumps to the program directory after starting to load or save a file.

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-COMPACT: "Preferences" menu item

Determination of volume to Annex B (single-point proctor test) of EN 13286-2:2010-12 can be activated via this menu item.



Enter the default values for the cylinder dimensions and for the metal plate in the dialog box. These data are adopted in the input fields in the editor boxes for the single tests in 'Edit/Tests'.

7.2 "Tests" menu item

7.2.1 GGU-COMPACT: Input for 'No container database available'

If no container database is available, you will see the following test data input dialog box:

Density				Water content			
No.	Wet sample + Cylinder [g]	Cylinder [g]	Volume Cylinder [cm³]	Wet sample + Container [g]	Dry sample + Container [g]	Container [g]	Single result
1	15047.00	10380.00	2209.00	6710.00	6600.00	1100.00	?
2	15155.00	10380.00	2209.00	6840.00	6620.00	1120.00	?
3	15311.00	10380.00	2209.00	6930.00	6600.00	1100.00	?
4	15352.00	10380.00	2209.00	6985.00	6600.00	1100.00	?
5	15338.00	10380.00	2209.00	7000.00	6560.00	1060.00	?

Five tests are already present in this example. The following buttons can be used:

"Done" / "Cancel"

You will arrive back at the menu bar with or without accepting your input or changes.

"Sort"

The tests can be sorted according to Wet sample + Cylinder.

"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 curve data"

The Proctor data (Proctor density and water content) for the entered individual tests are calculated and displayed in a message box. If over-coarse grain is present, the results with the over-coarse grain are displayed in an additional message box. The curve data are displayed in the bottom section of the form, if the corresponding object is activated (see menu item "**Output preferences/Proctor densities**", Section 5.2.7).

"Delete single test"

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

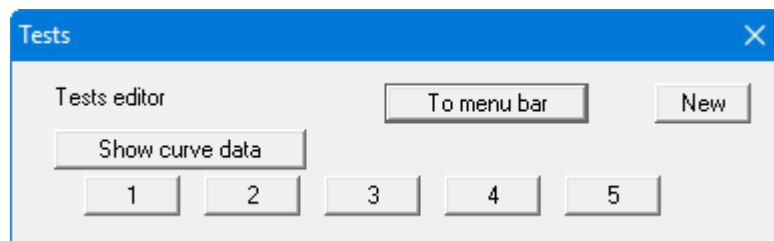
"?"

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

7.2.2 GGU-COMPACT: Input for 'Container database available'

If you use cylinders with standard weights for your tests it is recommended to store the weight and volume of the respective cylinders in a database. This saves repeated input by hand. The database can be stored using the menu item "Edit/Container database" (see Section 5.2.13).

If a container database is available, it is initially irrelevant whether the container database is actually used for test input. You will see the following dialog box after clicking the "Edit/Tests" menu item:



The tests are automatically numbered and the test numbers ("1, 2, 3, ...") shown on the respective buttons. After clicking on "New" or on the button of an existing test ("1", "2", ...) a dialog box opens for entering or editing test data.

Test 2

Density

Wet sample + cylinder [g] 15155.00

Cylinder data

☒ Individually

Cylinder [g] 10380.00

Cylinder volume [cm³] 2209.00

Database: mb = 5083.00 g; V = 1131.00 cm³ (Cylinder 1)

Water content

Wet sample + container [g] 6840.00

Dry sample + container [g] 6620.00

Container weight

☒ Individually [g] 1120.00

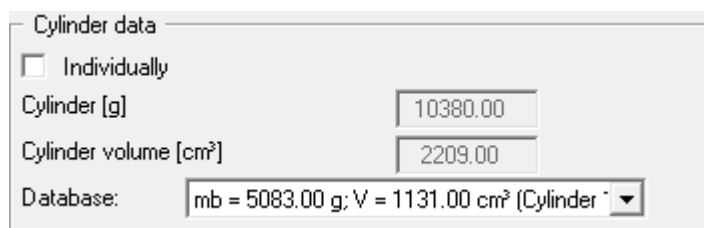
☐ Database mb = 5083.00 g (Cylinder 1)

Done Delete test

Duplicate test Show data

w from test 1

In the "Density" group box you enter the unit weights and the cylinder volumes for density determination. If a container database exists a "Cylinder data" group box is automatically displayed in the dialog box. If the "Individually" check box is deactivated the cylinder used can be selected from the drop-down combo box.



Cylinder data

☐ Individually

Cylinder [g] 10380.00

Cylinder volume [cm³] 2209.00

Database: mb = 5083.00 g; V = 1131.00 cm³ (Cylinder) ▼

In the "**Water content**" group box you enter the unit weights for the sample and container for water content determination. If a container database exists a "**Container weight**" group box is automatically displayed in the dialog box. After activating the "Database" option button the containers used can be selected from the drop-down combo box.

Furthermore, the following actions can be carried out:

"Done"

You will arrive back at the previous dialog box. All values entered will be accepted.

"Delete test"

The currently displayed test will be deleted.

"Duplicate test"

The currently displayed test will be duplicated. You will automatically find yourself in the next test.

"Show data"

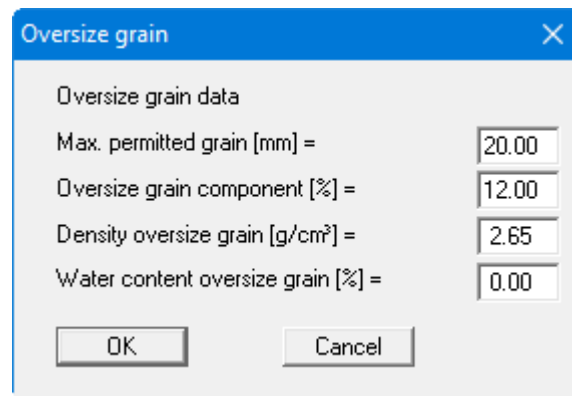
Result data (density and water content) for the current test will be calculated and displayed in a dialog box.

"w from Test 1"

If the 2nd individual test was created using "Duplicate test", the water content can be simply increased by a user-defined difference by pressing "**w from Test 1**", without the need to enter the real data for wet sample, etc. Each subsequent test then refers to the previous test, i.e. the button for the 3rd individual test reads "**w from Test 2**".

7.3 GGU-COMPACT: "Oversize grain" menu item

You enter the necessary oversize grain data using a dialog box.



Oversize grain

Oversize grain data

Max. permitted grain [mm] = 20.00

Oversize grain component [%] = 12.00

Density oversize grain [g/cm³] = 2.65

Water content oversize grain [%] = 0.00

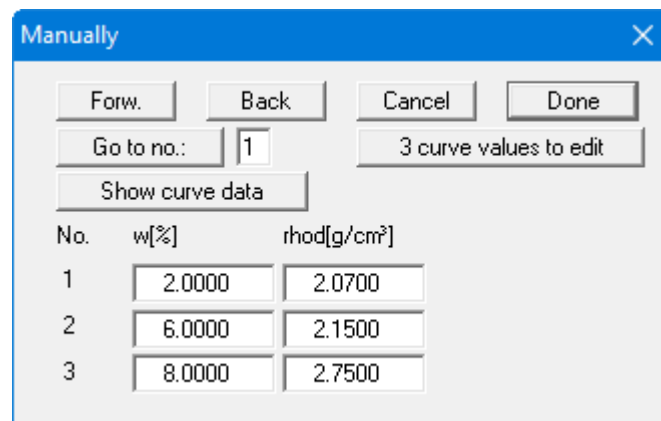
OK Cancel

7.4 GGU-COMPACT: "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.

7.5 GGU-COMPACT: "Test data input via editor" menu item

Beside input of the test data determined in the laboratory and the subsequent computation of the Proctor curve, it is also possible to enter the water content and associated dry density directly. This is useful, e.g., if you have a graphical Proctor curve from a different laboratory which you would like to use as an appendix in your own report. The following dialog box opens after a confirmation prompt:



Manually

Forw. Back Cancel Done

Go to no.: 1 3 curve values to edit

Show curve data

No.	w[%]	rhod[g/cm³]
1	2.0000	2.0700
2	6.0000	2.1500
3	8.0000	2.7500

First select the **"x curve values to edit"** button and enter the number of values to be edited (e.g. "3"). You can then enter the three value pairs (water content and density). After selecting the "Done" button, the test results will be graphically displayed. 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.

The dialog box shows a maximum of 8 value pairs simultaneously. If more than 8 data pairs have been entered you can move through the table with the "**Forw.**" and "**Back**" buttons or jump directly to the required data pair after entering the number using the "**Go to no.:**" button. Using the "**Show curve data**" button the Proctor data for the tests entered can be computed and displayed.

7.6 GGU-COMPACT: "Edit test data graphically" menu item

Occasionally, the Proctor curve may contain outliers, hindering proper evaluation of the data. Using this menu item, these outliers can be easily corrected using the mouse.

The Proctor curve is continuously corrected during displacement. If necessary, the correction can be undone using the [Back] button after releasing the left mouse button..

7.7 GGU-COMPACT: "Proctor densities" menu item

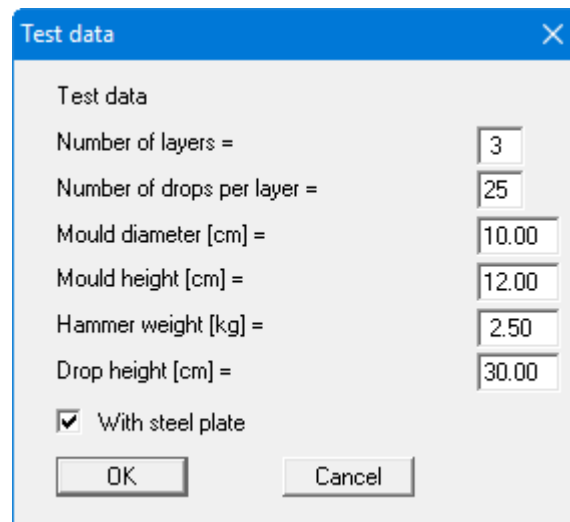
Two Proctor densities can be entered in the dialog box (e.g. 97% and 95%). These Proctor values and the corresponding water contents are computed and entered in the subsequent visualisation. Input of negative data prevents output.

7.8 GGU-COMPACT: "Saturation + air space ratio" menu item

Two saturation values (e.g. 100% and 97%) and an air space ratio may be given. The corresponding zero air space curves are then computed and entered for the subsequent visualisation. Input of negative data prevents output. If coastal defence investigations are being performed, the compaction requirements of the Hamburg coastal defence guidelines can be entered.

7.9 GGU-COMPACT: "Test data" menu item

The test data (blows per layer, etc.) can be entered in the dialog box. The data are not taken into consideration for the visualisation. They are only relevant to the test report output. Visualisation is activated using the menu item "**Output preferences/Test data**" (see Section 5.4.14).



Test data

Number of layers = 3

Number of drops per layer = 25

Mould diameter [cm] = 10.00

Mould height [cm] = 12.00

Hammer weight [kg] = 2.50

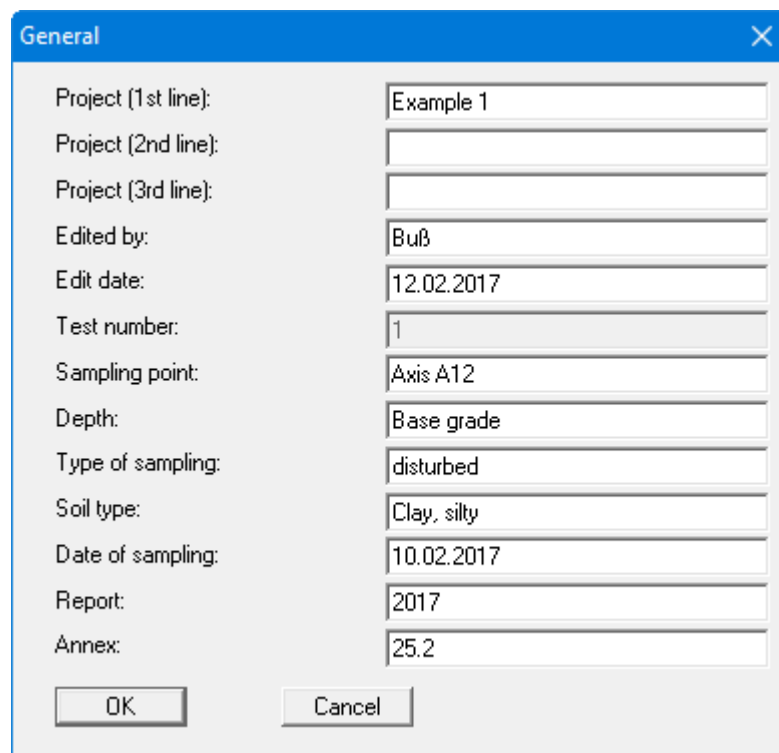
Drop height [cm] = 30.00

☒ With steel plate

OK Cancel

7.10 GGU-COMPACT: "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 1

Project (2nd line):

Project (3rd line):

Edited by: Buß

Edit date: 12.02.2017

Test number: 1

Sampling point: Axis A12

Depth: Base grade

Type of sampling: disturbed

Soil type: Clay, silty

Date of sampling: 10.02.2017

Report: 2017

Annex: 25.2

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" (see Section 5.4.3).

7.11 GGU-COMPACT: "Company" menu item

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

7.12 GGU-COMPACT: "Individual densities" menu item

If densities from field tests are available for a Proctor compaction test, these individual densities and water contents may be entered using this menu item. The marker size can be defined in this menu item's dialog box and whether the relative compaction is also displayed. The text for the individual densities legend, which can be activated via the menu item "**Output preferences/Individual densities**" (see Section 5.4.12), is also defined.

The individual densities entered here are only displayed in the Proctor curve diagram, if the "**Show individual densities**" check box in the "**Graphics preferences/Preferences**" menu item is activated (see Section 5.3.2).

7.13 GGU-COMPACT: "Container database" menu item

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

No.	Name	Weight [g]	Volume [cm³]
1	Mould 1	5083.00	1131.000
2	Cont. 1	86.75	800.100

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**" (see Page 14).

8 Graphics preferences menu

8.1 GGU-COMPACT: "View output table"/"View diagram" menu items

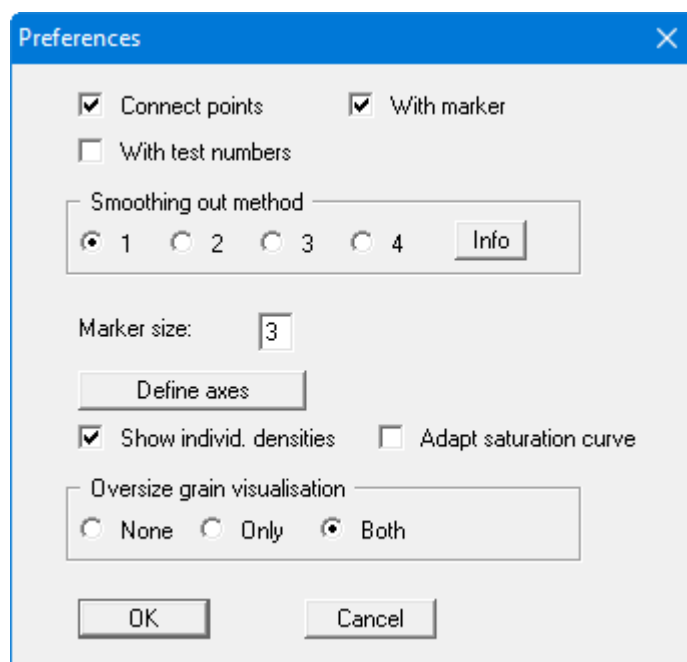
The default screen visualisation depicts the Proctor curve. If the menu item "**View output table**" is selected the results computed by the program are displayed in the shape of a report table with the most relevant test data and can then be printed as a laboratory report.

In order to return to the graphical visualisation of the Proctor curve, click on the now active menu item "**View diagram**" or simply on the tool in the Smart icon bar. You can move between the output table and the graphical visualisation using this tool.



8.2 GGU-COMPACT: "Preferences" menu item (Graphics)

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



By selecting the "**Connect points**" check box the measured data are connected to form a Proctor curve. This check box will only be deactivated in rare cases, if a Proctor curve is drawn *by hand*, for example. Define how the measured data points appear using the "**With markers**" and "**With test numbers**" check boxes. The marker size is user-defined. If neither of these check boxes are selected the measured data will not be marked.

Any one of four smoothing out methods can be applied to the Proctor curve visualisation. A message box provides information on the type of smoothing:

Method 1 = strict Bezier spline

Method 2 = "loose" Bezier spline

Method 3 = Newton interpolation

Method 4 = rational spline interpolation

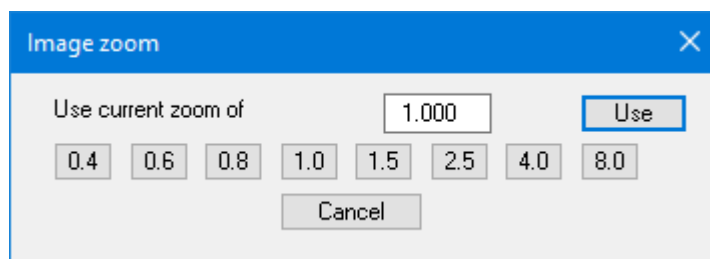
The best method may depend on the individual Proctor compaction test. A general recommendation cannot be given. However, all the examples used in the DIN 18127 can be almost exactly reproduced using the strict Bezier spline. This method is therefore activated by default.

The program automatically selects a sensible axes scale for the visualisation of the Proctor curve. If you select the "**Define axes**" button you are first offered the automatic scaling values in a further dialog box, which you can then edit as wished. In addition, visualisation of the individual densities, zero air space curve and oversize grain component can be activated and preferences defined.

8.3 GGU-COMPACT: "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.

8.4 GGU-COMPACT: "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.

8.5 GGU-COMPACT: "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.

8.6 GGU-COMPACT: "Font size selection" menu item

You can edit font sizes of texts [in mm] within the various input areas. Font size values > 2.0 mm may lead to the report table texts overflowing to one side. The report should therefore be optically examined if greater values are used. The default values are restored using the "Reset" button.

8.7 GGU_COMPACT: "Pen colour and width" menu item

In order to enhance the clarity of the graphics you can preset the pen settings for various graphic elements in the GGU programs.

You can change the pen widths for the elements listed in the dialog box and adjust the pen and/or fill colours by clicking on the button with the element name. In some GGU programs you can also define a line colour for selected elements.

For the graphic output of colours on **monochrome printers** (e.g. laser printers), colours are replaced by an equivalent shade of grey. In the case of very light colours, the corresponding graphic elements are then barely visible on the printer. In such cases, it makes sense to change the colour setting to darker colours.

8.8 GGU-COMPACT: "Mini-CAD toolbar" menu item

Using this menu item you can add free text to the graphics and add lines, circles, polygons and images (e.g. files in formats BMP, JPG, PSP, TIF, etc.). 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 saved in the 'C:\Program Files (x86)\GGU-Software\Manuals' folder during installation.

8.9 GGU-COMPACT: "Toolbar preferences" menu item

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.

8.10 GGU-COMPACT: "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.

8.11 GGU-COMPACT: "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-COMPACT.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-COMPACT: "Page size" menu item

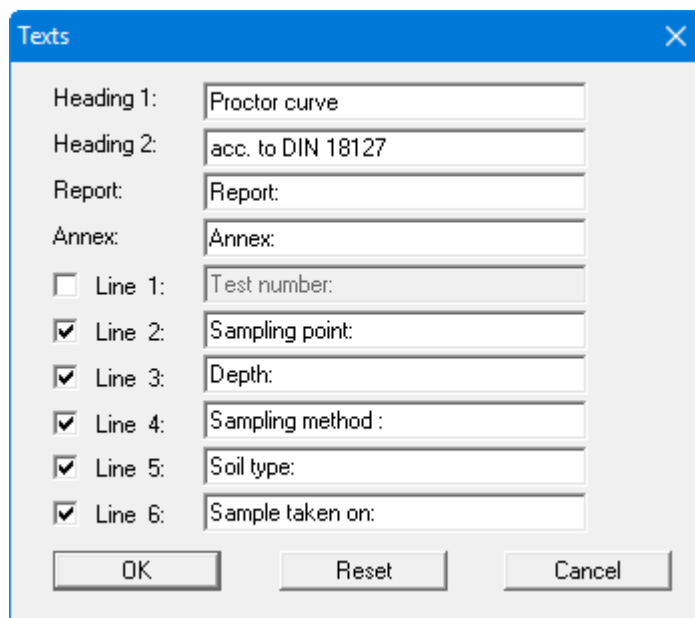
You can edit the page size in the dialog box of this menu item to your personal requirements.

9.2 GGU-COMPACT: "Output table where?" menu item

Specify in a dialog box whether the output table is to be integrated in the main graphics. If the **"Reset diagram positions"** query is then confirmed the output sheet is automatically set to A3 format. The output sheet elements are sensibly distributed on the new output sheet; however, they can also be redistributed according to the user's requirements.

9.3 GGU-COMPACT: "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.



Heading 1:	Proctor curve
Heading 2:	acc. to DIN 18127
Report:	Report:
Annex:	Annex:
☐ Line 1:	Test number:
☒ Line 2:	Sampling point:
☒ Line 3:	Depth:
☒ Line 4:	Sampling method :
☒ Line 5:	Soil type:
☒ Line 6:	Sample taken on:

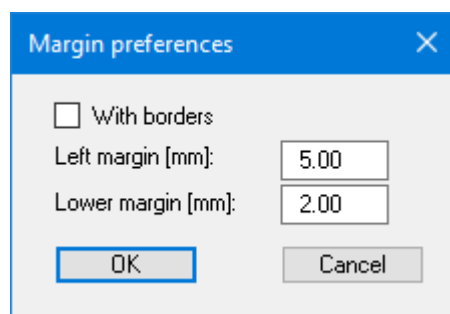
OK Reset Cancel

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 (see Section 5.2.10).

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-COMPACT: "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.



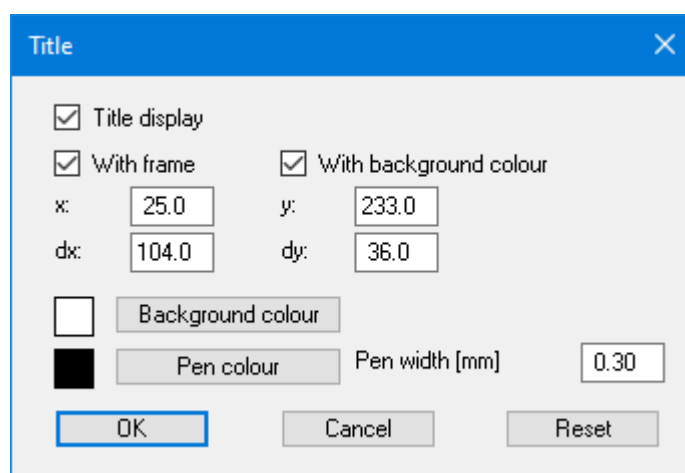
By deactivating the "**With borders**" check box and with an appropriate choice of left and lower margins, it is generally possible to create a non-reduced printer output. It is necessary to also adapt the page height and width (see menu item "**Output preferences/Page size**").

9.5 GGU-COMPACT: "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-COMPACT: "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**").

9.7 GGU-COMPACT: "Proctor densities" menu item (Output)

A dialog box opens that is almost identical to that for the previous menu item. The same preferences can be specified in this box as in that described in Section 5.4.6. Proceed as described there to alter the position or layout of the "**Proctor densities**" element.

9.8 GGU-COMPACT: "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-COMPACT: "Test no., etc." menu item

Almost exactly the same dialog box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the "**Test no., etc.**", element, simply proceed as is described there.

The input for this element can be edited immediately after double-clicking on the element or via the menu item "**Edit/General**" (see Section 5.2.10). 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**" (see Section 5.4.3).

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

Almost exactly the same dialog box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the "**Annex and report**" element, simply proceed as described there.

The input for this element can be edited immediately after double-clicking on the element or via the menu item **"Edit/General"** (see Section 5.2.10). 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"** (see Section 5.4.3).

9.11 GGU-COMPACT: "Proctor curve" menu item

Because the grading curve is the central graphical element, it cannot be switched off. Almost exactly the same dialog box opens with the same preference options as that described in the **"Output preferences/Title (change position)"** menu item (see Section 5.4.6). To edit the **"Proctor curve"** element, simply proceed as described there.

9.12 GGU-COMPACT: "Individual densities" menu item (Output)

Almost exactly the same dialog box opens with the same preference options as that described in the **"Output preferences/Title (change position)"** menu item (see Section 5.4.6). To edit the individual densities legend, simply proceed as described there.

The legend is deactivated in the program default setting. If the check box **"Display individual densities"** is activated in this menu item's dialog box, the legend is shown in the Proctor curve diagram on the output sheet. The legend labelling and the marker size for the individual densities can be edited directly by double-clicking the legend or using the menu item **"Edit/Individual densities"** (see Section 5.2.11).

9.13 GGU-COMPACT: "Output table" menu item

Almost exactly the same dialog box opens with the same preference options as that described in the **"Output preferences/Title (change position)"** menu item (see Section 5.4.6). To edit the **"Output table"**, element, simply proceed as is described there.

9.14 GGU-COMPACT: "Test data" menu item (Output)

Almost exactly the same dialog box opens with the same preference options as that described in the **"Output preferences/Title (change position)"** menu item (see Section 5.4.6). To edit the **"Test data"** element, simply proceed as described there.

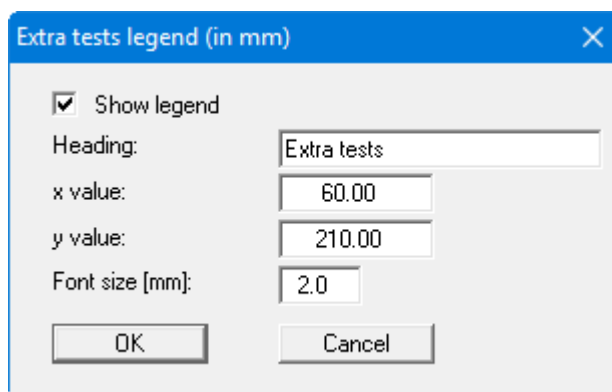
This element is deactivated in the program default setting. If the check box **"Display test data"** is activated in this menu item's dialog box, the legend is shown in the output table representation on the output sheet. The input for this element can be edited via the menu item **"Edit/Test data"** (see Section 5.2.9).

9.15 GGU-COMPACT: "Oversize grain" menu item (Output)

Almost exactly the same dialog box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the oversize grain legend, simply proceed as described there

9.16 GGU-COMPACT: "Extra tests" menu item

The legend for the extra tests is activated by default when the program starts up; however, it is only shown if extra tests are loaded using the menu item "**Special/Define extra tests**" (see Section 5.5.3). In this menu item the following dialog box opens for defining the legend:



The legend heading is defined in the first input box. Labelling of the extra tests in the legend is specified in the menu item "**Special/Define extra tests**" (see Section 5.5.3). You can define and edit the position of the legend using the "**x value**" and "**y value**". The size of the legend is controlled using "**Font size**".

9.17 GGU-COMPACT: "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.

9.18 GGU-COMPACT: "Move objects" menu item

When you go to this item you can move the various objects with the aid of the mouse. Move the mouse over the object to be moved. When you are located above a moveable object the mouse pointer appears in the shape of a cross. You can now press and hold the left mouse button and drag the object to the required position.

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

In order to move or edit several objects, this function can be more quickly activated by pressing [F11] or the icon.



The size of an object can also be altered using this menu item or the [F11] key. If you move over the frame of a changeable object after activating this function the mouse assumed the shape of a double-headed arrow. Hold the left mouse button and move the frame until the object has reached the required size. To retain the ratio of the sides, pull at one corner only. If on one side only is pulled the object will become higher or wider.

The last change made in the position or size of an object can be undone using [Back] or by clicking the icon.



10 Special menu

10.1 GGU-COMPACT: General notes

Beside visualisation of the current Proctor test, it is possible to visualise up to 15 further tests using the "**Special**" menu. A legend is shown for these tests (henceforth known as extra tests), allowing allocation of a line type to the test designations. For example, boundary curves can be displayed via the extra tests.

10.2 GGU-COMPACT: "Project identification" menu item

A project identification can be entered in this menu item's dialog box; it is then saved with the current data. If this file is loaded into a different test as an extra test using "**Special/Define extra tests**", the project identification is automatically entered there as the name of the extra test.

10.3 GGU-COMPACT: "Define extra tests" menu item

In order to use further tests in the visualisation, previously defined tests can be loaded using this menu item. The following dialog box appears:

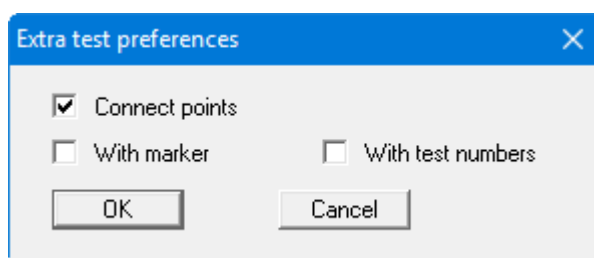
No.	No. values	Designation
1	6	Upper limit
2	5	Lower limit
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	
11	0	
12	0	
13	0	
14	0	
15	0	

Select the required Proctor compaction test after clicking the "**Load**" button. The "Designation" box then appears for the selected test; enter a fitting test description. In the example above 2 Proctor curves have been loaded, representing the upper and lower boundaries of the permissible region. The designations entered are later adopted as curve descriptions in the extra tests legend (see Section 5.4.16). If a file with a project identification is loaded as an extra test (see Section 5.5.2), this is automatically entered into the "**Designation**" box.

The number of respective individual tests in the loaded extra tests is displayed in the dialog box. Once a file has been loaded, the "**Load**" button changes to a "**Delete**" button. This allows extra tests that are no longer needed to be deleted again.

10.4 GGU-COMPACT: "Extra tests preferences" menu item

Visualisation of the extra tests can also be influenced. The following dialog box appears:



Here, the individual tests can be connected and provided with markers or test numbers.

10.5 GGU-COMPACT: "Extra tests pen colour and width" menu item

The colour, width, type of dashing and dash length can be defined for the individual curves visualising the extra tests, in analogy to the menu item "**Graphics preferences/Pen colour and width**" (see Section 5.3.7).

10.6 GGU-COMPACT: "General legend" menu item

This legend is deactivated in the program default setting. If the "**Display legend**" check box is activated in the dialog box for this menu item, the element is displayed in the visualisation on the output sheet. A heading can be entered in this menu item's dialog box and the type of file name display selected. When using the "**Complete file name**" setting the file name is displayed with the complete path. You can define and edit the position of the legend using the "**x value**" and "**y value**". The size of the legend is controlled using "**Font size**".

Date/time (values in mm) ✕

☒ Show legend

Heading:

x value:

y value:

Font size [mm]:

☒ With frame

Desig. in front of file name:
 ▼
 ▼

11 GGU-CONNECT menu

11.1 GGU-COMPACT: "Info" menu item

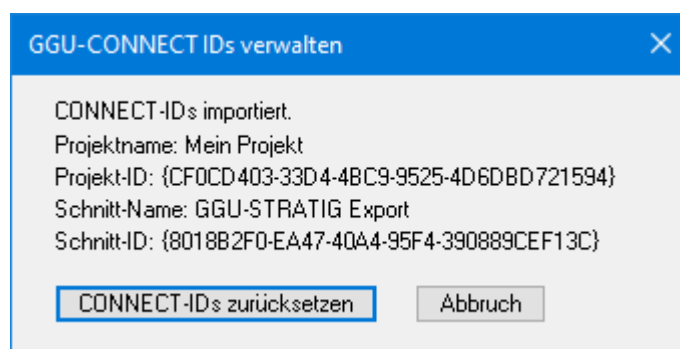
You will receive a short information about the new **GGU-CONNECT** program, which enables the organisation of geotechnical data.

11.2 GGU-COMPACT: "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**:



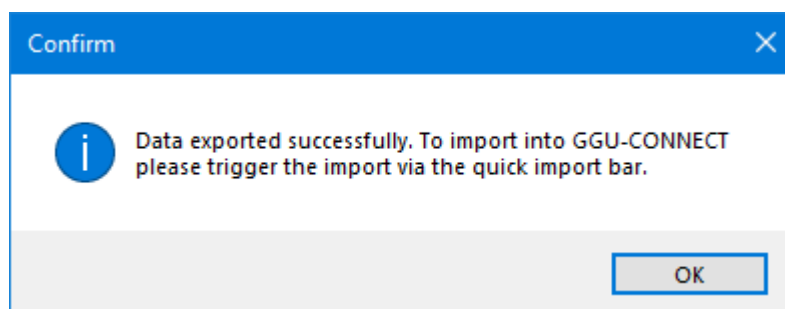
You can delete these IDs by clicking on the **"Reset CONNECT IDs"** button. If, for example, you copy and change a drilling profile to which a **CONNECT ID** has already been assigned, this ID would otherwise exist twice. The next time you save or import into **GGU-CONNECT**, the profiles will be assigned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

11.3 GGU-COMPACT: "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.

11.4 GGU-COMPACT: "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:



12 Info menu

12.1 GGU-COMPACT: 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.

12.2 GGU-COMPACT: "Maxima" menu item

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

12.3 GGU-COMPACT: "Help" menu item

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

12.4 GGU-COMPACT: "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.

12.5 GGU-COMPACT: "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.

12.6 GGU-COMPACT: "What's new?" menu item

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

12.7 GGU-COMPACT: "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.