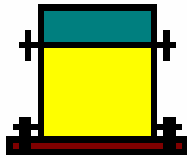


Evaluation and visualisation of Proctor compaction tests to German Standard DIN 18127

GGU-COMPACT

VERSION 8



Last revision: June 2018
Copyright: Prof. Dr. Johann Buß
Technical implementation and sales: Civilserve GmbH, Steinfeld

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1 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.

Data input is in accordance with conventional WINDOWS operations and can therefore be learned almost entirely without the use of a manual. Graphic output supports the true-type fonts supplied with WINDOWS, so that excellent layout is guaranteed. Colour output and any graphics (e.g. files in formats BMP, JPG, PSP, TIF, etc.) are supported. DXF files can also be imported by means of the integrated **Mini-CAD** module (see the "**Mini-CAD**" manual).

The program has been successfully used in a large number of projects by renowned consultancies and institutes, and has been thoroughly tested. The program system has been thoroughly tested. No faults 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 Licence protection and installation

In order to guarantee a high degree of quality, a hardware-based copy protection system is used for the **GGU-COMPACT** program.

The GGU software protected by the *CodeMeter* copy protection system is only available in conjunction with the *CodeMeter stick* copy protection component (hardware for connection to the PC, "*CM stick*"). Because of the way the system is configured, the protected software can only be operated with the corresponding CM stick. This creates a fixed link between the software licence and the CM stick copy protection hardware; the licence as such is thus represented by the CM stick. The correct Runtime Kit for the CodeMeter stick must be installed on your PC.

Upon start-up and during running, the **GGU-COMPACT** program checks that a CM stick is connected. If it has been removed, the program can no longer be executed.

For installation of GGU software and the CodeMeter software please refer to the information in the *Installation notes for GGU Software International*, which are supplied with the program.

3 Language selection

GGU-COMPACT is a bilingual program. The program always starts with the language setting applicable when it was last ended.

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 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 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 **GGU-COMPACT** screen is not refreshed after every alteration.

If you would like to refresh the screen contents, press either [F2] or [Esc]. The [Esc] key additionally sets the screen presentation back to your current zoom, which has the default value 1.0, corresponding to an A4 format sheet.

5 Description of menu items

5.1 File menu

5.1.1 "New" menu item

All data entered are deleted after a confirmation prompt. New tests can then be entered.

5.1.2 "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.

5.1.3 "Save" menu item

You can save data entered or edited during program use to a file, in order 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.

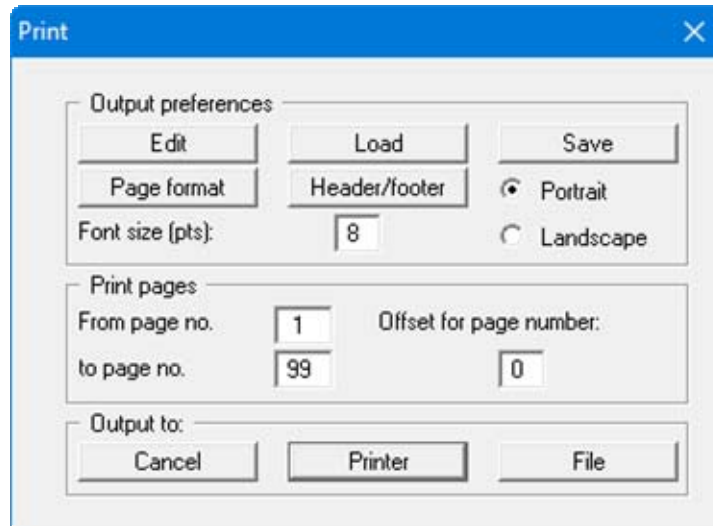
5.1.4 "Save as" menu item

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.

5.1.5 "Print 'simple' output table" menu item

A result table containing the current test results can be printed or saved in a file (e.g. for further editing in a word processing application). Output consists of a type of laboratory protocol of the Proctor tests, as entered in the menu item "**Edit/Tests**". By going to the menu item "**Graphics preferences/View output table**" (see Section 5.3.1) you can view and print the laboratory output table in the shape of a submission quality output sheet.

After going to this menu item you will see the following dialog box for specifying the simple table output:



- "**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 "**GGU-COMPACT.drk**" as file name and save the file in the program folder (default), the file will be automatically loaded the next time you start the program.

Using the "**Page format**" button you can define, amongst other things, the size of the left margin and the number of rows 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.

5.1.6 "Export to ASCII" menu item

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

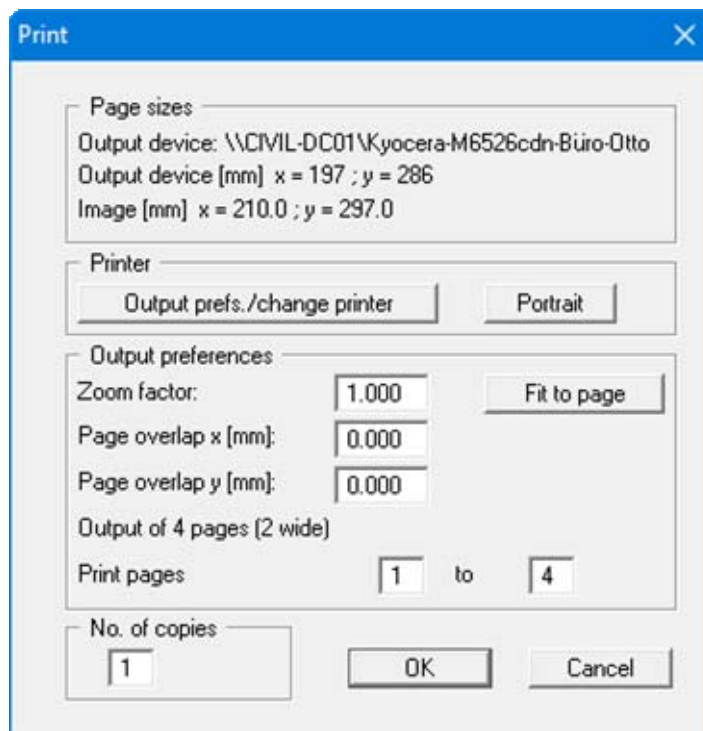
5.1.7 "Output preferences" menu item

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

5.1.8 "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 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). In order 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. 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.

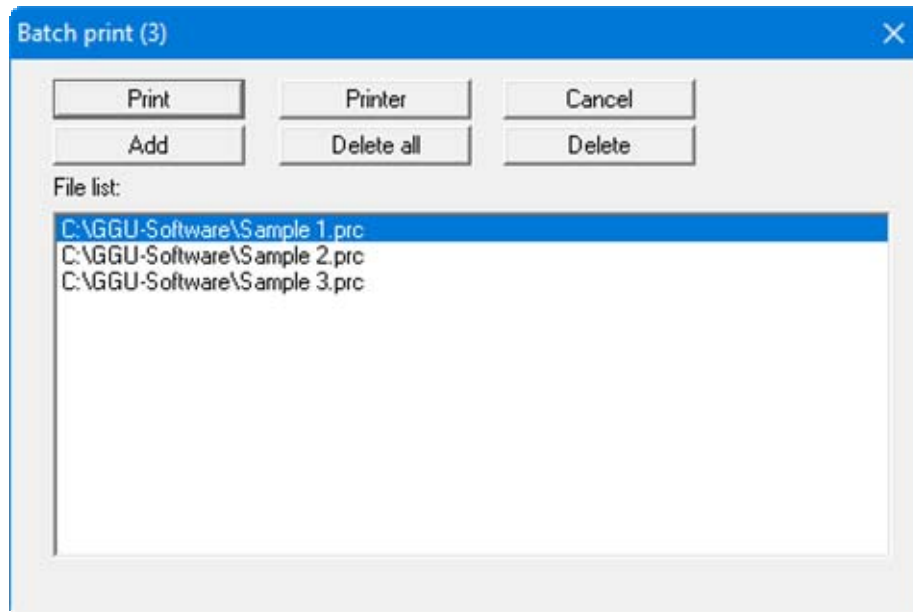
If you select the **"Copy/print area"** tool  from the toolbar, you can copy parts of the graphics to the clipboard or save them to an EMF file. Alternatively you can send the marked area directly to your printer (see **"Tips and tricks"** in Section 6.3).

Using the **"Mini-CAD"** program module you can also import EMF files generated using other GGU applications into your graphics.

- **"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.

5.1.9 "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 output 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.

5.1.10 "Exit" menu item

After a confirmation prompt, you can quit the program.

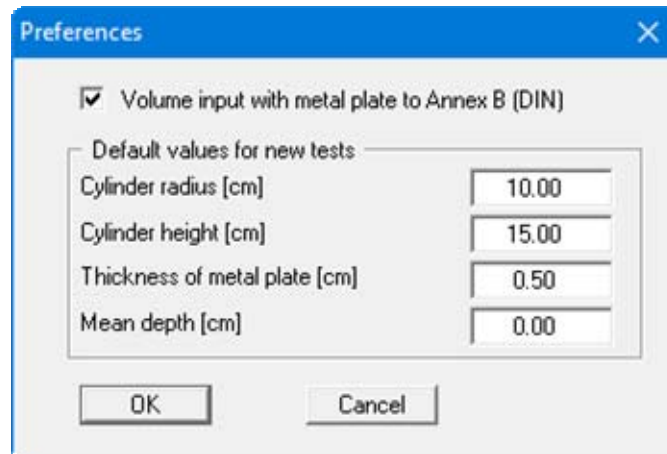
5.1.11 "1, 2, 3, 4" menu items

The "**1, 2, 3, 4**" menu items show the last four files worked on. By selecting one of these menu items the listed file will be loaded. If you have saved files in any other folder than the program folder, you can save yourself the occasionally onerous *rummaging* through various sub-folders.

5.2 Edit menu

5.2.1 "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'.

5.2.2 "Tests" menu item

This menu item represents the program's central menu item, which can also be opened by double-clicking in the Proctor curve using the left mouse button. Almost all the fundamental data for the Proctor compaction test are entered here. You will see different dialog boxes for entering test data, depending on whether a container database is available.

5.2.2.1 Input for 'No container database available'

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

The screenshot shows a dialog box titled "Tests" with a close button (X) in the top right corner. The dialog is divided into several sections:

- Operations:** Contains buttons for "Done", "Cancel", "Sort", "5 Tests to edit", "Delete single test", and "Show curve data".
- Density:** A table with 5 rows and 4 columns: "No.", "Wet sample + Cylinder [g]", "Cylinder [g]", and "Volume Cylinder [cm³]".
- Water content:** A table with 5 rows and 4 columns: "Wet sample + Container [g]", "Dry sample + Container [g]", "Container [g]", and "Single result".

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	?

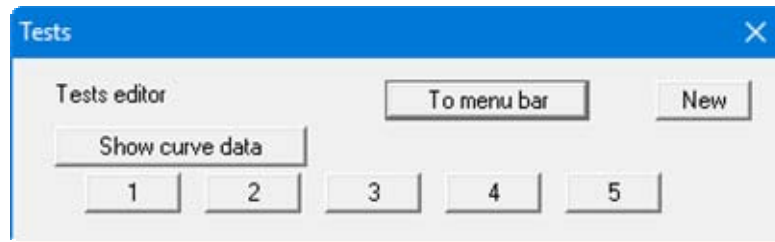
Five tests are already present in this example. The following buttons can be used:

- **"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.

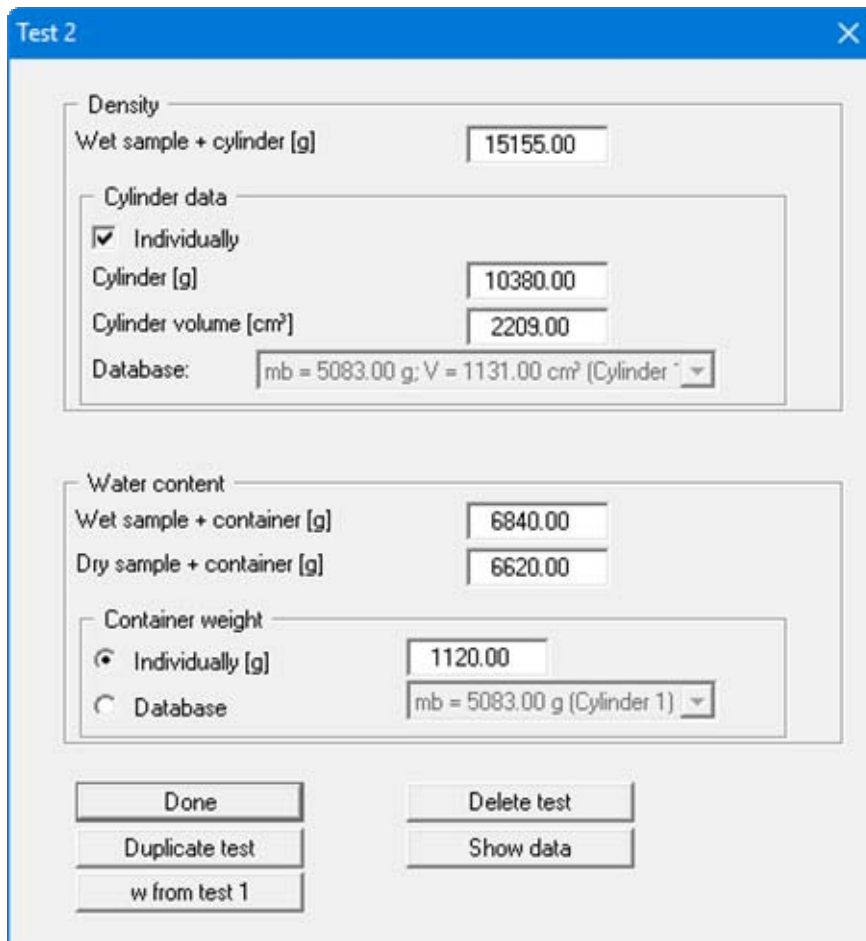
5.2.2.2 Input for 'Container database available'

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).

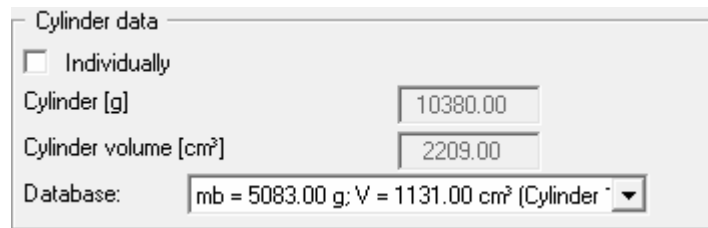
If a container database is available, it is initially irrelevant whether the container database is actually used for test input. You will see the following dialog box after clicking the **"Edit/Tests"** menu item:



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.



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.



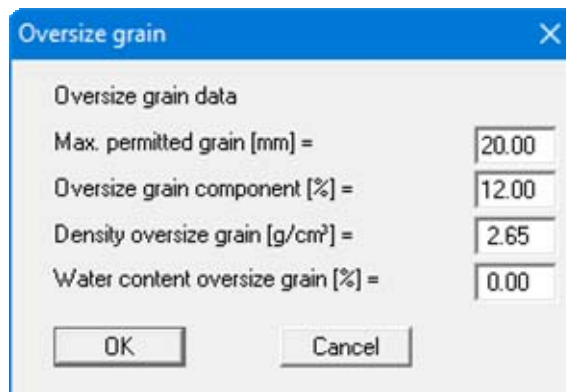
In the "**Water content**" group box you enter the unit weights for the sample and container for water content determination. If a container database exists a "**Container weight**" group box is automatically displayed in the dialog box. After activating the "**Database**" option button the containers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

5.2.3 "Oversize grain" menu item

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



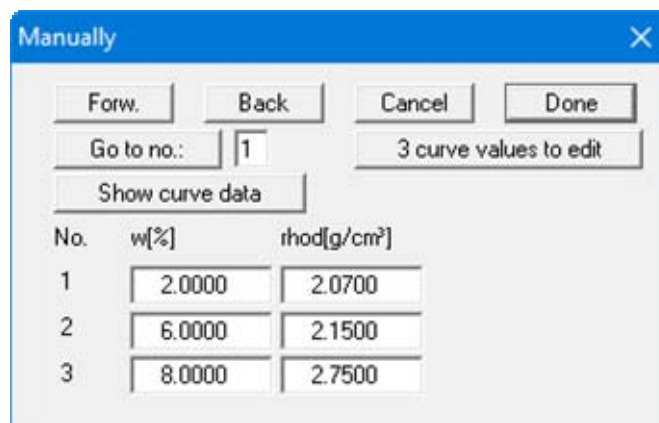
Oversize grain data	
Max. permitted grain [mm] =	20.00
Oversize grain component [%] =	12.00
Density oversize grain [g/cm ³] =	2.65
Water content oversize grain [%] =	0.00

5.2.4 "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.

5.2.5 "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:



No.	w[%]	rhod[g/cm ³]
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.

5.2.6 "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..

5.2.7 "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.

5.2.8 "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.

5.2.9 "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

5.2.10 "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.

Label	Value
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

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).

5.2.11 "Company" menu item

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

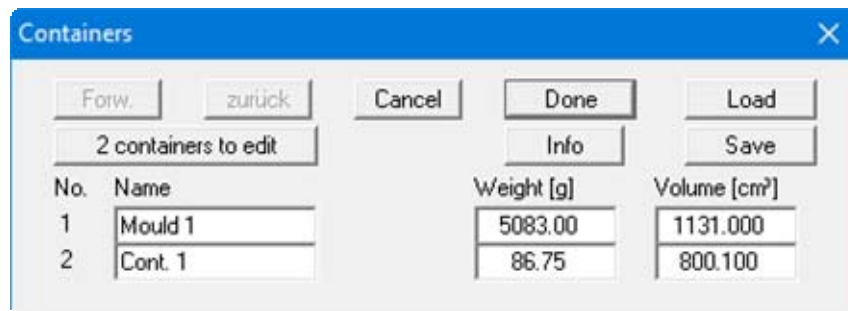
5.2.12 "Individual densities" menu item

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).

5.2.13 "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.



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).

5.3 Graphics preferences menu

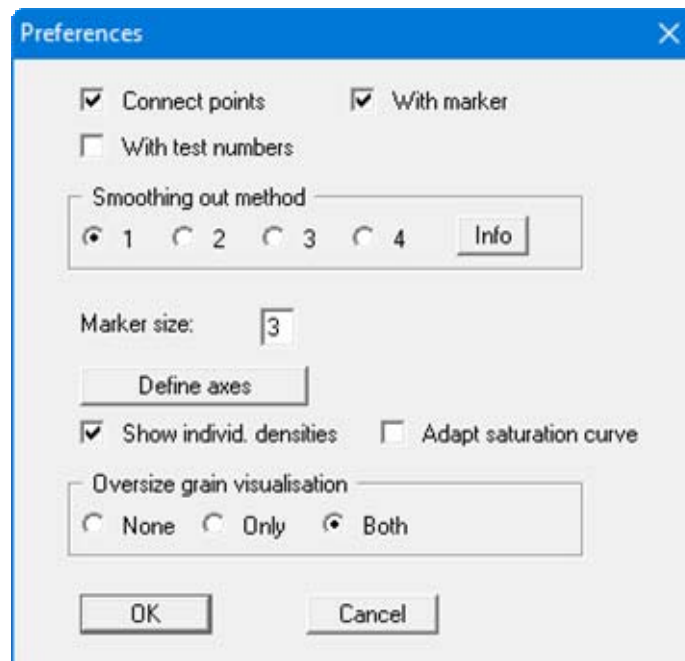
5.3.1 "View output table"/"View diagram" menu items

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.

5.3.2 "Preferences" menu item

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

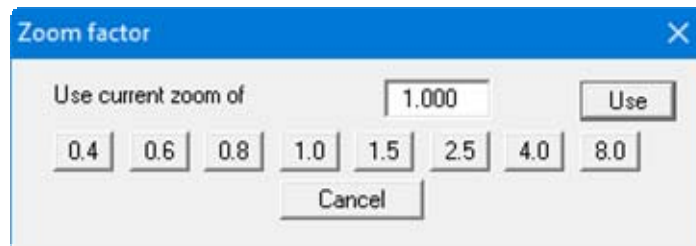
The best method may depend on the individual Proctor compaction test. A general recommendation cannot be given. However, all the examples used in the DIN 18127 can be almost exactly reproduced using the *strict* Bezier spline. This method is therefore activated by default.

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.

5.3.3 "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.

5.3.4 "Zoom info" menu item

By clicking two diametrically opposed points you can enlarge a section of the screen in order to view details better. An information box provides information on activating the zoom function and on available options.

5.3.5 "Legend font selection" menu item

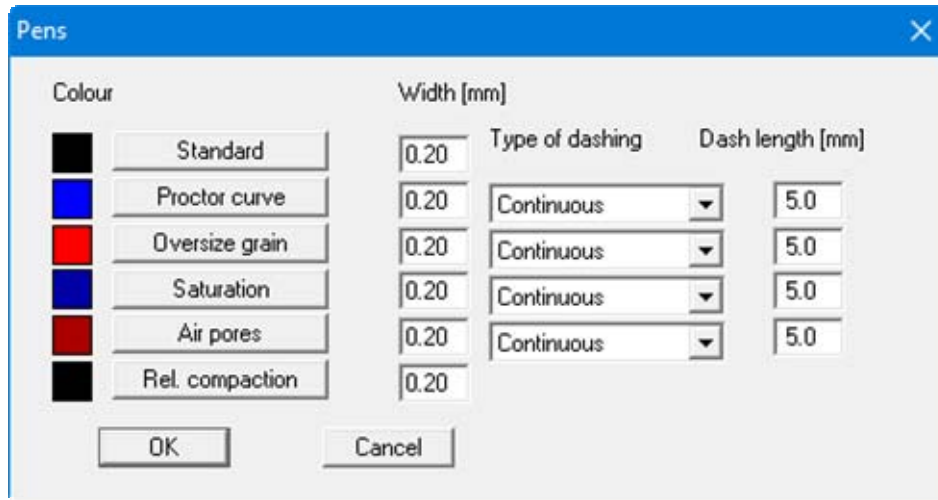
With this menu item you can switch to a different true-type font. All available true-type fonts are displayed in the dialog box.

5.3.6 "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.

5.3.7 "Pen colour and width" menu item

For reasons of clarity, different colours are used as default for graphic presentation of the different lines, as well as the type of dashing. With this menu item you can alter the preferences to suit your wishes.



The pen width, line type and dashing can be edited for the listed lines and, after clicking the appropriate buttons, the pen colours be adapted.

On *monochrome printers* (e.g. laser printers), colours are shown in a corresponding grey scale. Graphic elements employing very light colours may be difficult to see. In such cases it makes sense to edit the colour preferences.

5.3.8 "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.). A pop-up menu opens; the icons and functions used are described in more detail in the "**Mini-CAD**" manual provided.

5.3.9 "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-COMPACT.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 can be activated from the normal menu items.



"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.



"Undo move object"

If you have previously edited the position or size of an object on the output sheet ([F11] or used "Output preferences/Move objects"), you can undo the last modification with this tool.



"Restore move object"

If you have previously undone a modification, you can restore with this tool.



"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" in Section 6.3).



"Output table/Diagram"

By clicking on this icon you can switch between the *tabular representation* and the *graphics representation*.

5.3.10 "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.

5.3.11 "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".

5.4 Output preferences menu

5.4.1 "Page size" menu item

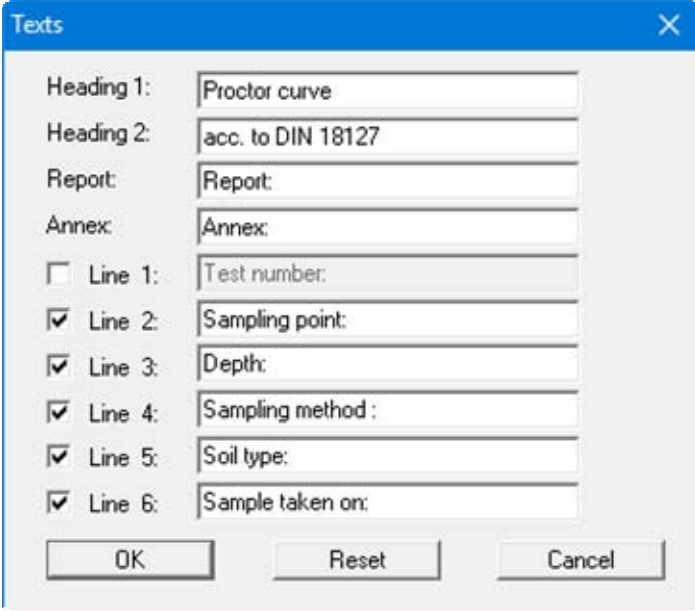
The default page set-up is A4 (portrait) when the program is started. You can edit the page size in the dialog box.

5.4.2 "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.

5.4.3 "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.

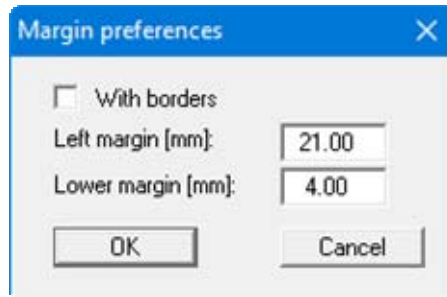


Your input in rows 1 to 6 of the above dialog box, as well as the input for "**Report:**" and "**Annex:**" also represent the designations for the input boxes in the "**Edit/General**" menu item dialog box. If lines are deactivated in the above dialog box, the corresponding input boxes in the "**Edit/General**"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

5.4.4 "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.



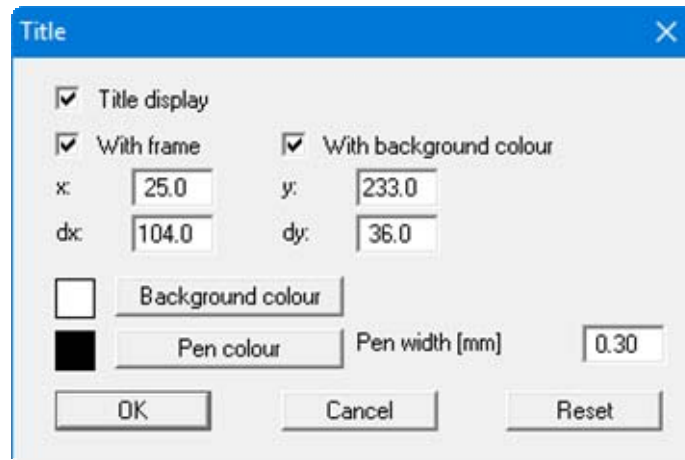
By deactivating the "**With borders**" check box and with an appropriate choice of left and lower margins, it is generally possible to create a non-reduced printer output. It is necessary to also adapt the page height and width (see Section 5.4).

5.4.5 "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.

5.4.6 "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", Section 5.4.18).

The heading "Proctor curve" shown in the title element can be edited in the menu item "Output preferences/Texts" (see Section 5.4.3). The texts "Project (1st line)" to "Project (3rd line)" are entered immediately after double-clicking the element or using the menu item "Edit/General" (see Section 5.2.10).

5.4.7 "Proctor densities" menu item

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.

5.4.8 "Company" 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). Simply proceed as described there to edit the "Company" element.

The input for this element can be edited immediately after double-clicking on the element or via the menu item "Edit/Company" (see Section 5.2.11).

5.4.9 "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).

5.4.10 "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).

5.4.11 "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.

5.4.12 "Individual densities" 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 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).

5.4.13 "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.

5.4.14 "Test data" 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 data**" element, simply proceed as described there.

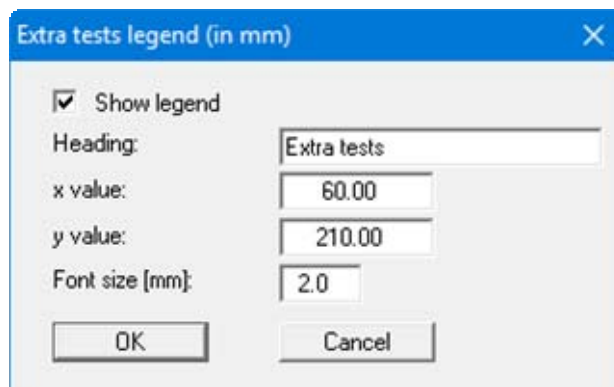
This element is deactivated in the program default setting. If the check box "**Display test data**" is activated in this menu item's dialog box, the legend is shown in the output table representation on the output sheet. The input for this element can be edited via the menu item "**Edit/Test data**"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

5.4.15 "Oversize grain" 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 oversize grain legend, simply proceed as described there

5.4.16 "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**".


5.4.17 "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.


5.4.18 "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.

5.5 *Special menu*

5.5.1 General notes

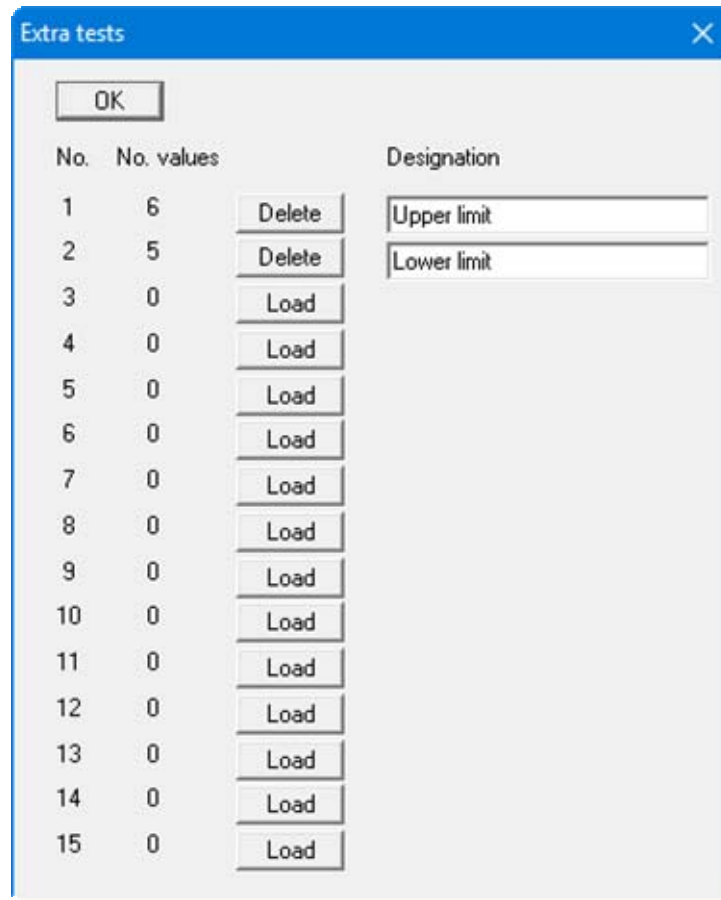
Beside visualisation of the current Proctor test, it is possible to visualise up to 15 further tests using the "Special" menu. A legend is shown for these tests (henceforth known as extra tests), allowing allocation of a line type to the test designations. For example, boundary curves can be displayed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

5.5.2 "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.

5.5.3 "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:

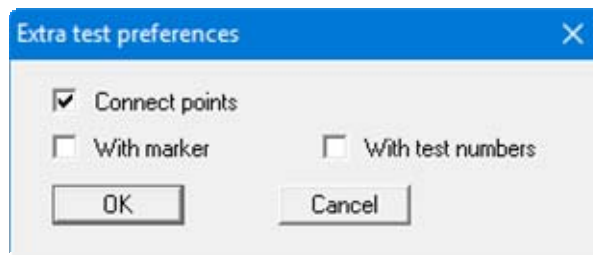


Select the required Proctor compaction test after clicking the "Load" button. The "Designation" box then appears for the selected test; enter a fitting test description. In the example above 2 Proctor curves have been loaded, representing the upper and lower boundaries of the permissible region. The 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.

5.5.4 "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.

5.5.5 "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).

5.5.6 "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**".



5.6 Info menu

5.6.1 "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 GGU-COMPACT.

5.6.2 "Maxima" menu item

Information on the maximum number of tests, extra tests and individual densities possible is displayed in a message box.

5.6.3 "Help" menu item

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

5.6.4 "GGU on the web" menu item

Using this menu item you can access the GGU Software website: www.ggu-software.com. Keep in touch with new program versions and the regular *download* offers.

If you would like to be automatically notified about program innovations, please register for the Newsletter in our Knowledge Base. Go to the following website: <http://kbase.civilserve.com>.

5.6.5 "GGU support" menu item

This menu item takes to the GGU-Software Support area at www.ggu-software.com.

5.6.6 "What's new?" menu item

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

5.6.7 "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.

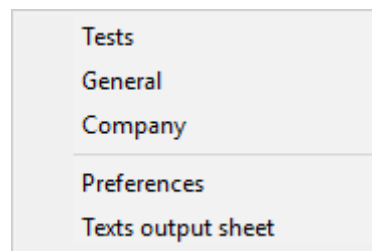
6 Tips and tricks

6.1 Keyboard and mouse

You can scroll the screen with the keyboard using the cursor keys and the [**Page up**] and [**Page down**] keys. By clicking and pulling with the mouse, with [**Ctrl**] pressed, you activate the zoom function, i.e. the selected section will fill the screen. Furthermore you can use the mouse wheel to zoom in/out or scrolling the screen presentation. The following mouse wheel functions are available:

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

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 output sheet or **Mini-CAD** objects, the editor for the selected object immediately opens, allowing it to be edited. By double-clicking output sheet elements while holding the [**Shift**] key, the preferences for the position, size and appearance of the element open for editing in the editor.

6.2 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 contents and sets the screen back to the given format (A4). This is useful if, for example, you have used the zoom function to display parts of the screen and would like to quickly return to a complete overview.
- [**F1**] opens the manual file.
- [**F2**] refreshes the screen without altering the current magnification.
- [**F11**] activates the menu item "**Output preferences/Move objects**".

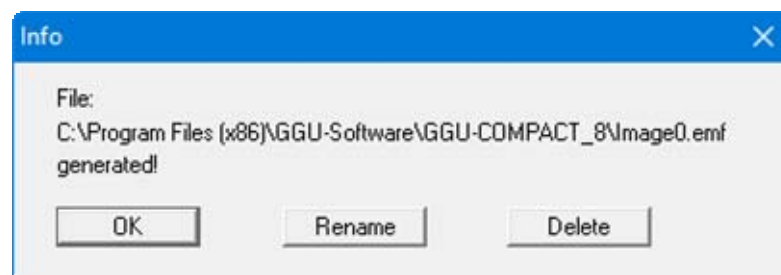
6.3 "Copy/print area" icon

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 opens once the area has been defined:



The default location of the file is the folder from which the program is started 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.

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