Manual

Evaluation Software



Translation

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1 Notes on the Operating Manual

This operating manual is a technical guide on how to operate the device safely and it contains all the information required for the areas specified in the table of contents. This technical documentation is a reference and instruction manual. The individual chapters are complete in themselves.

Familiarity (of the respective target groups defined according to area) with the relevant chapters is a precondition for the safe and appropriate use of the device.

This operating manual does not contain any repair instructions. If faults arise or repairs are necessary, please contact your supplier or get in touch with Retsch GmbH directly.

Application technology information relating to samples to be processed is not included but can be read on the Internet on the respective device's page at www.retsch.com .

1.1 Explanations of the safety warnings

In this Operating Manual we give you the following safety warnings

Serious injury may result from failing to heed these safety warnings. We give you the following warnings and corresponding content.

⚠ WARNING

Type of danger / personal injury
Source of danger

– Possible consequences if the dangers are not observed.

• **Instructions on how the dangers are to be avoided.**

We also use the following signal word box in the text or in the instructions on action to be taken:

⚠ WARNING

Moderate or mild injury may result from failing to heed these safety warnings. We give you the following warnings and corresponding content.

⚠ CAUTION

Type of danger / personal injury
Source of danger

– Possible consequences if the dangers are not observed.

• **Instructions on how the dangers are to be avoided.**

We also use the following signal word box in the text or in the instructions on action to be taken:

⚠ CAUTION

In the event of possible **property damage** we inform you with the word “Instructions” and the corresponding content.

NOTICE

Nature of the property damage
Source of property damage

– Possible consequences if the instructions are not observed.

• **Instructions on how the dangers are to be avoided.**

We also use the following signal word in the text or in the instructions on action to be taken:

NOTICE

1.2 General safety instructions

Target group : All persons concerned with the machine in any form

This machine is a modern, high performance product from Retsch GmbH and complies with the state of the art. Operational safety is given if the machine is handled for the intended purpose and attention is given to this technical documentation.

CAUTION

Possibility of personal injuries
Unexpected or accidental start-up of sieving machine.

– Depending on the sieving machine used and if simultaneously controlled by means of EasySieve, there is the potential for danger. Please read the relevant warning instructions in the operating instructions for the respective sieving machine.

- **The actuated sieving machine must be in the EasySieve operator's field of vision.**
- **Observe the operating instructions and warnings for your sieving machine.**

2 Confirmation (Form for the operator)

This operating manual contains fundamental instructions and it is imperative that they be heeded when using this software . It is essential that they be read by the operator and by the qualified staff responsible for the software before the software is used. This operating manual must be available and accessible at the place of use at all times.

The user of this software herewith confirms to the managing operator / owner that (s)he has been given sufficient instructions about the use of the software. The user has received the operating manual, has read and taken note of its contents and consequently has all the information required for safe use and is sufficiently familiar with the software.

As the owner/managing operator you should for your own protection have your employees confirm that they have received instructions on how to use the software.

I have read and taken note of the contents of all chapters in this operating manual as well as all safety instructions and warnings.

User
Surname, first name (block letters)
Position in the company
Signature

Service technician or operator
Surname, first name (block letters)
Position in the company
Place, date and signature

3 Installation

- IBM-compatible personal computer, Pentium II or higher
- Operating system: Windows 2000/XP/Vista (32-bit)/7 (32-bit)
- Hard drive with at least 15 MB of available space
- Random Access Memory: 128 MB
- VGA graphics card with at least 1024 x 768 pixels
- CD-ROM drive
- Interface for printer
- 2 interfaces for balance and if necessary sieving machine
- Printer

As is the case with all software installations you need authorisation to install it on your PC. If necessary, please contact your system administrator.

3.1 Installation

Please start EasySieve_set-up.exe from the installation CD-ROM. Then follow the user prompting.

During installation the SIEVESYSand SIEVEDAT directories are created in the

C:\Documents and Settings\All users\Application Data\EasySieve

directory. SIEVESYS has the RETSCH.afg (standard sieving task) and RETSCH.gkl (Retsch standard sieve stack) files. SIEVEDAT has a Retsch subdirectory with the Retsch001.rdf and Retsch002.rdf sieving files.

As soon as these files are there, all EasySieve menu items can be selected.

All files required for Help and the EasySieveDocumentation_de.pdf manual are installed in the program directory also.

4 General Notes

This software serves to support sievings and the storage and representation of particle size distributions determined with the sieve analysis. For each sieving the measurements are stored in a file (rdf file) and are then available for extensive evaluation.

EasySieve permits the use of 16 sieves + sieve base. The largest supported sieve mesh aperture size is 125 mm.

The use of EasySieve for sieve analysis requires three steps, which are separate from each other:

1. Definition of a sieving task
2. Execution of the sieving
3. Evaluation of the results

EasySieve controls the following sieving machines automatically:

- AS 200 control
- AS 200 tap
- AS 200 jet

- AS 300 control
- AS 400 control
- AS 450 control

For control purposes, the sieving machine must be connected to the computer through a free serial interface (RS232).

Automatic weight transfer is also possible from a balance equipped with a serial data interface. EasySieve can accept manually input data too of course.

The evaluation can be conducted at a separate time from the measurement, i.e. the raw data can be inputted again later and evaluated. The raw data contains the name of the associated sieving task. This is loaded when a raw data file is read if another sieving task was active beforehand. Consequently the raw data is always evaluated with the parameters that were set in the sieving task at the time of the evaluation. This makes it possible to evaluate measurements at a later point in time with altered parameters.

To prevent an accidental alteration of the parameters in a sieving task, password protection can be activated in EasySieve with two user levels:

1. Measuring mode:
   - Measurements and evaluation are possible. The measuring mode is particularly suitable for routine operation.
2. Task mode:
   - In addition to the measuring mode, it is also possible to create and alter sieving tasks. EasySieve is always in task mode if the password protection has not been activated.

     The task mode is intended for qualified users with a very good knowledge of the program.

Note: The following describes all the menus active in the task mode. Some of the menus described are inactive in the measuring mode and accordingly not visible.

The files in which the sieving tasks are defined are filed in the sub-directory...\SIEVESYS . The measuring results are filed as consecutive files in the sub-directory… \ SIEVEDAT \ <Name of sub-directory>. The sub-directory is defined in the sieving task. An increment postfix will be created automatically by the software in order to prevent existing sieving files being overwritten.

Example:

Directory:	Sand
File name:	Test
File no.:	6

The sieving result is stored in the following raw data file.

...\SIEVEDAT\Sand\Test006.rdf

The creation of the following files is optional.

...\SIEVEDAT\Sand\Test006.ccg

...\SIEVEDAT\Sand\Test006.xld

...\SIEVEDAT\Sand\Test006.xle

4.1 File System

The program directory software selected during installation has the easysieve.exe and easysieve.hlp software. The …\SIEVESYS and ….\SIEVEDAT sub-directories are stored in the program directory too.

In the SIEVESYS sub-directory the program stores the following files:

task files	*.afg (internal format)
sieve stack files	*.gkl (internal format)
reference files	*.ref (ASCII format)

Files in ASCII format (*.ref) can be presented as reference curves at the same time as the sieve curves in the diagram and serve to generate the adjustment files.

In the SIEVEDAT sub-directory further sub-directories are created, whose names are decided in the individual sieving tasks. The following sieving files are stored in these sub-directories:

- *.rdf Raw data files (raw data in the internal format)
- *.xle EXCEL decimal point, English (measurements table - EXCEL D decimal point English, configurable, optional)
- *.xld EXCEL decimal comma, German (measurements table in EXCEL decimal comma, configurable, optional)
- *.ccg RETSCH file format (ASCII format, optional)

After installation RETSCH.afg (first sieving task) and RETSCH.gkl (sieve stack file for the standard Retsch sieve stack) are in \SIEVESYS. SIEVEDAT has a \RETSCH sub-directory with a RETSCH_001.rdf sieving.

4.2 Creation of a sieving task

A sieving task file contains all the EasySieve program settings required for the sieving and to show the results of a particular type of material. These settings are stored in the *.afg task file. This task file contains:

All sieving parameters

- the log texts defined for the task
- directory, file name and file number for the result files
- The name of the associated sieve stack file in which the limits desired for the evaluation are stored.
- information on which result files are to be created
- the density [g/cm³] of the material
- settings in the measurement table
- settings in the measurement diagram
- settings for calculating characteristics
- settings for the trend analysis

At the point of time of the commencement of a sieving there must be at least one sieving task file and the associated sieve stack file.

An existing sieving task can be edited in the “Sieving Analysis”– “Edit sieving task” menu item. Then all the windows in which the essential parameters for measurement and presentation can be set are opened one after another (“Next” key). The sieving task is stored at the end of the procedure.

The “Sieving” – “New Sieving Task” menu item is used to produce a new sieving task quickly. Initialisations can be set quickly by input a “file name” and all settings in the sieving task can be determined quickly with a “minimum run”.

Alternatively the menu items can be called up separately:

- “Options” - “sieving parameters”

  definition of the sieving parameters and characteristics
- “Options” - “Edit sieve stack file”

  definition of the sieves and storage in a sieve stack file
- “Evaluation” - “table”

  setting of the type of tabular presentation of the sieving result
- “Evaluation” - “graph”

  setting of the type of representation of the sieving result as a graph

  choice of the axes, characteristics, colours, legend etc.
- “Sieve analysis” - “save sieving task”
- Input of comment, name of the sub-directory, name of the results file, number of the results file
- Input of the material density
- Storage of the sieving task

In addition, the trend analysis settings are transferred into the sieving task.

A sieve stack file is created by left-clicking on the “Save” button in the “Edit sieve stack file” menu item and entering a file name.

A sieving task is created by calling up the “Sieve analysis” - “Save sieving task” menu item. There must already be a sieve stack.

The desired sieving parameters and display parameters must be set under the “Options” - “Sieving Parameters” menu item. The parameters for the evaluation must be selected in the “Evaluation” - “Table” and ”Evaluation" - “Graph” menu items.

4.3 Evaluating Measuring Results

The measuring results can be evaluated as a graph or table. Characteristics, which are typical of the whole measurement are presented in a separate window. The corresponding menu items are “Evaluation” “Table…”, “Evaluation” - “Graph” and “Evaluation” - “Characteristics…”. The diagram can show several curves ((maximum of 10).

A trend analysis is conducted to compare several measurements in a series of measurements. It allows the time-dependent behaviour of some characteristics to be examined. The “Evaluation” “Mean” menu item allows the mean value of the sieving results of a maximum 50 measurements belonging to a sieving task to be calculated and presented.

All evaluation data can be printed and also copied into the clipboard. When the “File” - “Print Report…” menu item is called up, a log of the sieving measurements is printed out.

4.4 Characteristics

The following characteristics of particle size distributions can be determined with EasySieve:

p3 (x1, x2)	Fractions p3 (x1, x2) (volume fractions in the individual sieve classes)
Q3 (x)	Cumulative distribution of Q3 (x), volume-related
1-Q3 (x)	Cumulative residue distribution of 1-Q3 (x), volume-related
q3 (x)	Distribution density q3 (x), volume-related

The following characteristics can be determined with EasySieve:

x (Q3)	x, where Q3 has a given value
Span	Span value
U	Unevenness, volume-related

Also available in EasySieve Comfort:

Sv	specific surface Sv, volume-related
Sm	specific interface Sm, mass-related
Sauter diameter	Sauter diameter x_{St}
AFS no.	AFS Particle Fineness Number (calculable only if the selected sieves permit the calculation)

RRSB values:
(The RRSB characteristics can be calculated only if the Q3 values of at least 2 sieve fractions are between 5% and 95%)

n	Rise in the RRSB line
d'	x value at which Q3(x)=0.632
Correlation	Correlation between the RRSB lines and Q3 (x)

The characteristics are explained in more detail in the characteristics section.

4.5 Password Protection

When password protection is activated , the program controlled by the input of a password can be used in measuring mode or in task mode as desired.

In the EasySieve software the measuring mode is intended for the execution of measurements and for routine evaluations with preset parameters. In the task mode it is also possible to change all sieving task parameters.

When password protection is activated, EasySieve is in the measuring mode after start. The task mode is enabled once a password is inputted. The password protection can be deactivated by the user in the task mode. The program is always in task mode then.

The following menu items in the main window are in the task mode in addition:

“Options” “Sieving parameters”

“Options” “Edit sieve stack file”

“Sieve analysis” “Save sieving task”

“Extras” “Language”

“Extras” “Screen font”

“Extras” “Printer font”

“Extras” “Set printer log”

The “Sieve analysis” dialogue box is different. Under the “Sieve analysis” – “load sieving task” menu item the loaded sieving tasks cannot be edited in the measuring mode. It is not possible either to change the characteristics setting for the trend analysis.

All the following descriptions of how the software functions refer to the menus in the task mode.

4.6 Toolbar and Function Keys

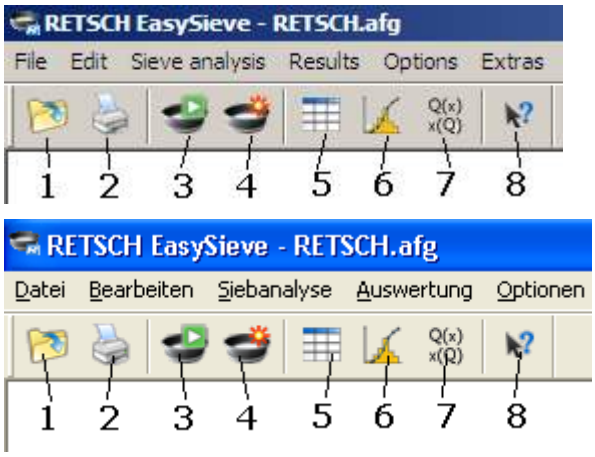


Fig. 1: Toolbar

Frequently used functions in the EasySieve software can be activated very quickly by clicking on the buttons in the toolbar in the main window or by means of the function keys.

The following table shows a summary of the toolbar buttons. They are numbered from left to right. If the button corresponds to a menu item, the menu item is named beside it. Otherwise the function of the button is described in brief.

No. of the button	Menu item or function
1	“File” - “Open results file”
2	“File” - “Print Report”
3	“Start sieving”
4	New sieving
5	Results table
6	Results graph
7	Characteristics
8	Help invocation

The following functions are accessible with the function keys:

Function key	Menu item or function
F1	Help invocation

F2	“Start sieving”
F5	“Evaluation” - “Table”
F6	“Evaluation” - “Graph”
F7	“Evaluation” - “Characteristics”

4.7 Conducting the First Sieving

Once EasySieve is installed, the first sieving file can be transferred very easily. If the standard Retsch sieve stack (45-µm, 63-µm, 125-µm, 250-µm, 500-µm, 1-mm, 2-mm, 4-mm sieves) is to be used and the sieving machine and balance are not automatically controlled, the “Sieve Analysis “- “Start Sieve Analysis” menu item can be called up immediately.

Otherwise the “Sieve Analysis” – “New Sieving Task” menu item should be called up. With prompting the settings are gradually made for:

– sieving parameters (including setting-up of sieving machine and balance)

– editing of sieve stack file (selection of the sieves to be used)

– saving of sieving task (setting of results files and report texts, storage of the .afg file containing all settings*)

The first sieving can be run through with EasySieve if so desired.

5 Main Window - Description of the Menu Items

5.1 File - Menu Commands

The **File** menu contains the following commands:

- Open results file…
- Save results file as…
- Export results file…
- Set up printer…
- Preview report
- Print report…
- List of a selection of the last files
- Exit

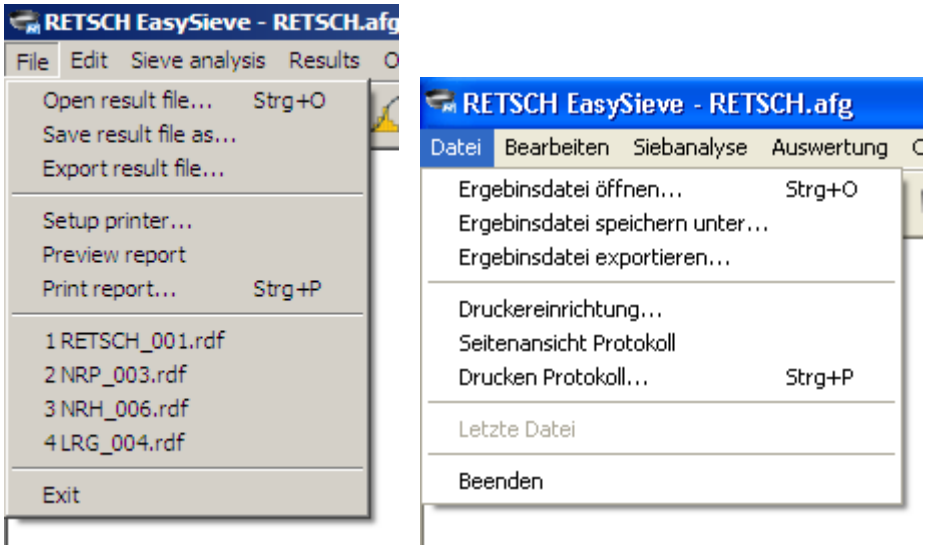
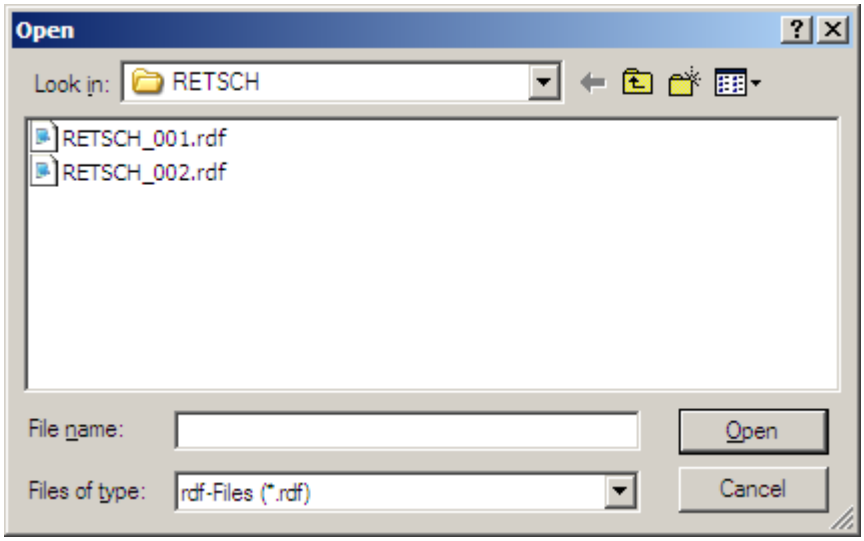


Fig. 2: File Menu

5.1.1 Open Results File

Use this command to open a stored sieving.

First an “Open” dialogue field appears allowing the file to be selected.



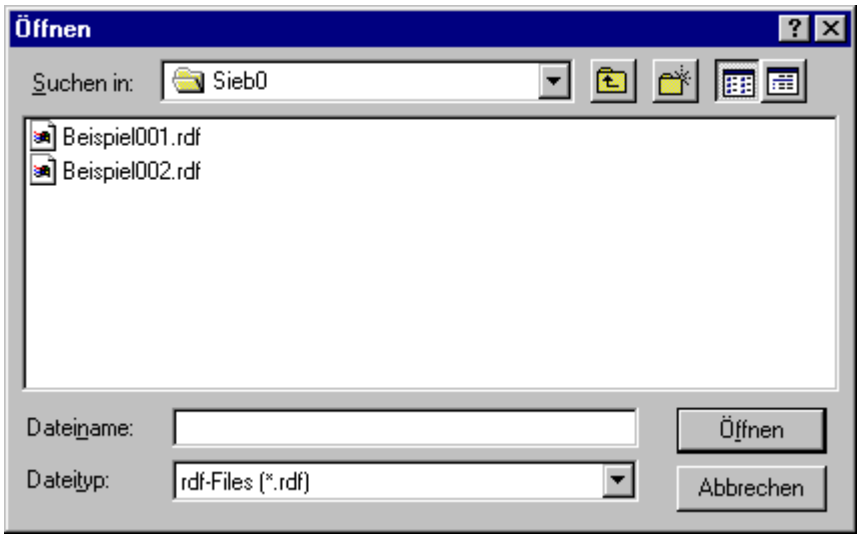


Fig. 3: “Open” to select a file

Once a raw data file is selected and the window is exited by clicking on “OK”, the selected file is read. In each raw data file the name of the associated sieving task is stored. This sieving task is loaded (if not already active). The results are evaluated and presented by means of the now valid setting of the sieving task.

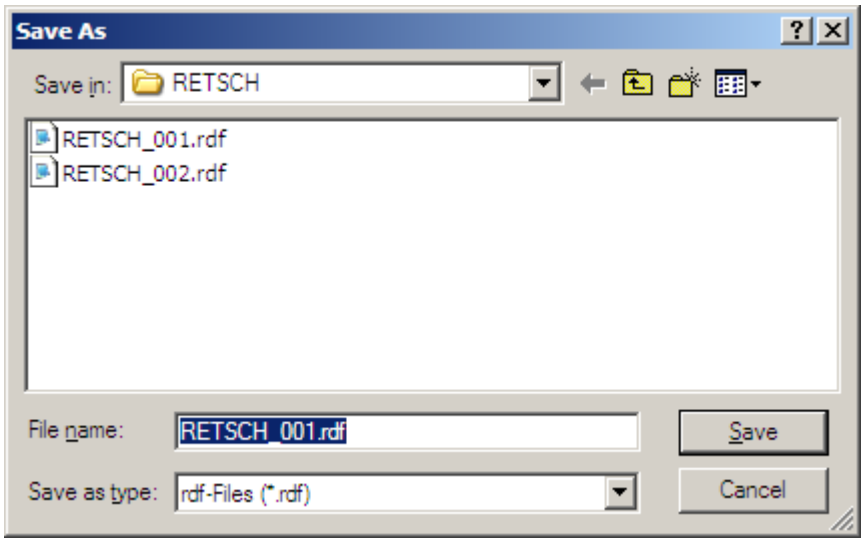
NOTE
If the sieving task was changed after the measurement, the results presented can differ from those in an evaluation conducted directly after the measurement!

If one of the evaluation windows is open already, its contents will be updated. If no evaluation window is open, the diagram window is opened and the sieving result for the read file is presented as a graph.

You can create new sievings (rdf files) by means of the “Sieve analysis” menu item.

5.1.2 Save Results File as

Use this command to save and rename the active sieving. EasySieve displays the “Save As” dialogue field so that you can assign a name to the rdf file you are generating.



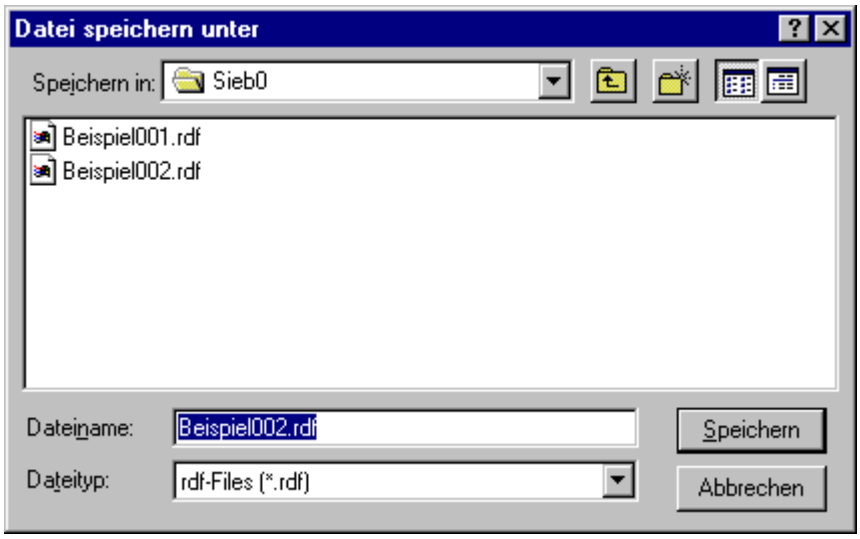
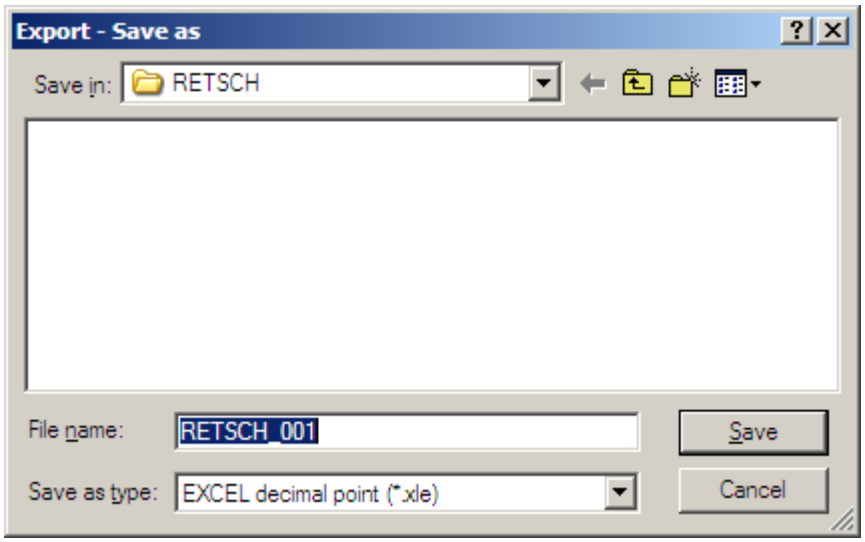


Fig. 4: Save as

The save command is used to store a sieving under its existing name and directory.

5.1.3 Exporting Results File

Use this command to save the active sieving in a file format that Excel can read. EasySieve displays the “Save as” dialogue field so that you can assign a name to the Excel or ASCII file which is to be produced.



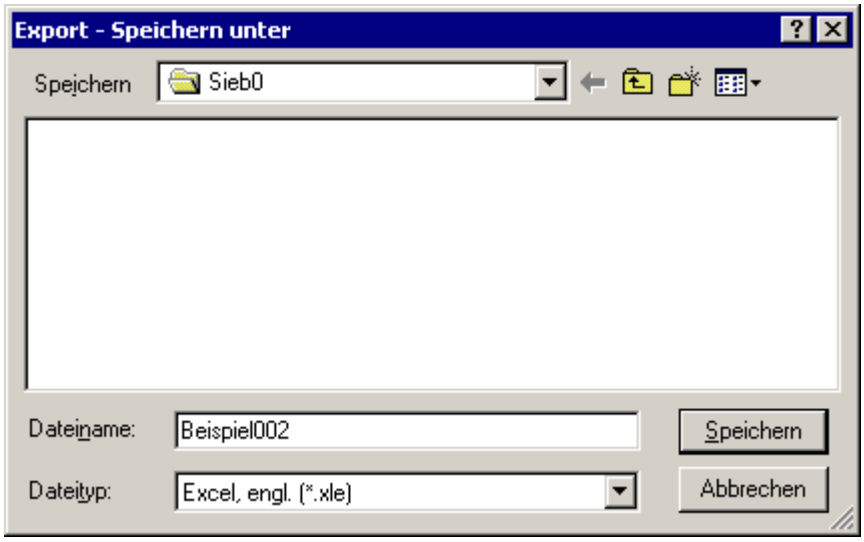


Fig. 5: Export Results File

Possible file formats are:

XLD Excel decimal comma (German setting)

XLE Excel decimal point (English setting)

CCG RETSCH format

The XLD and XLE files are structured analogously. The columns and units of measurement are chosen in the table window. All results selected there are entered into the file as a column. A maximum of 6 representations are possible (p3, Q3, 1-Q3, q3, Δm, $\Sigma\Delta m$). The first two columns contain the lower and upper limits for the fraction. The values Q3 (x), 1-Q3 (x), refer to the upper class limit. On the other hand the q3 value refers to the middle of the faction and p3 to the fraction.

In the XLD files decimal numbers are presented with a “comma”, while in the XLE files they are presented with a “point”.

The CCG file consists of two columns. The first column is the particle size x in mm and the second column is the Q3 (x) - value (between 0 and 1). Decimal numbers are shown with a comma.

5.1.4 Printer Set-up

Use this command to choose a printer and decide on a printer connection. When this command is selected, the printer set-up window appears and you can choose the printer and its port in this window.

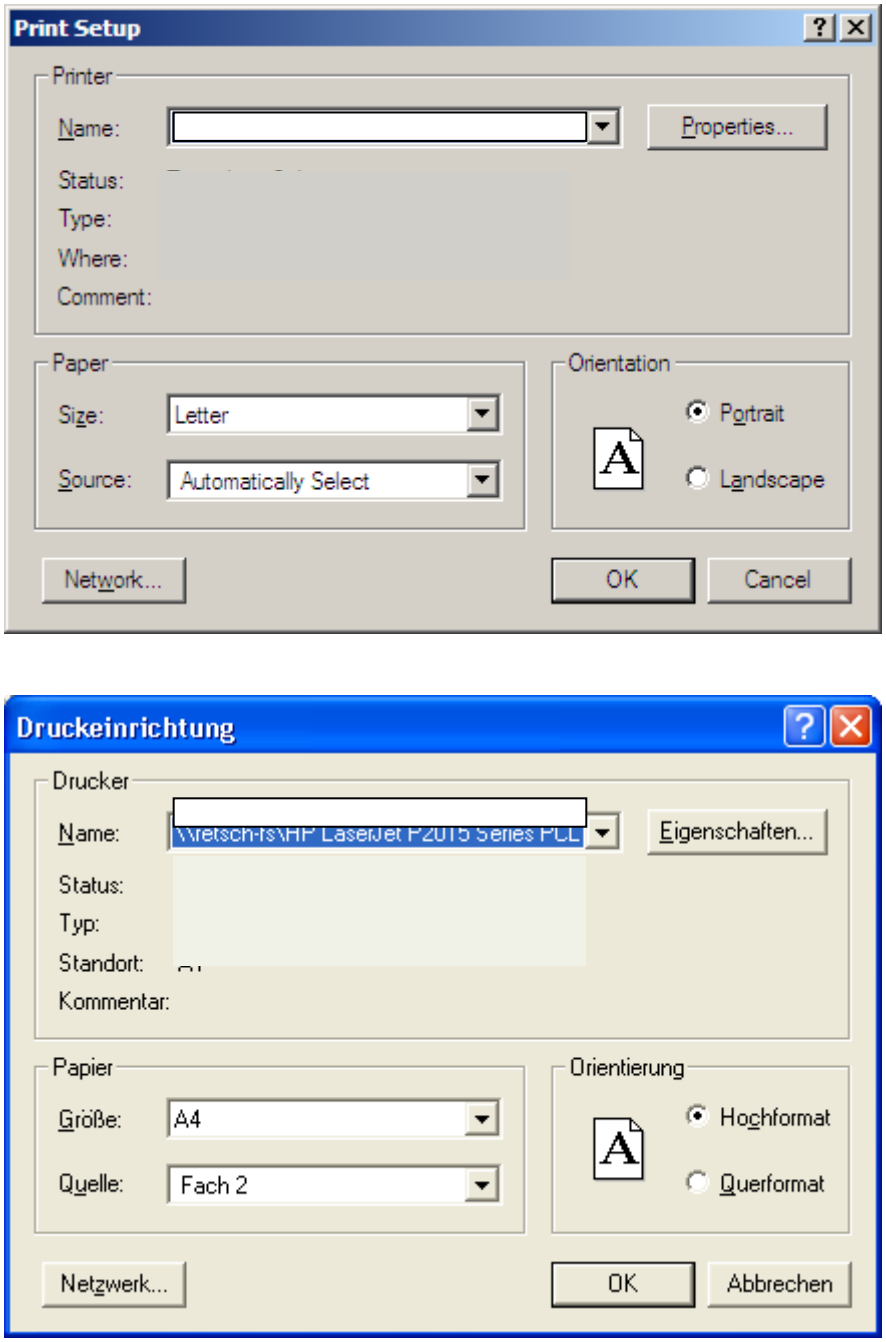


Fig. 6: Printer set-up

5.1.5 Print Preview Print Report

Use this command to display the sieving report as it would appear when printed. When this command is selected, the main window is replaced by a print preview window showing one or two pages in print format.

In the symbol bar on the print preview you can decide if you wish to view one or two pages at the same time. You can also move forwards and backwards in the document, have pages shown in a larger or smaller size or start printing.

5.1.6 Print Report

Use this command to print a log of the sieving procedure. The printed sieving log consists of

- header information
- table
- graph
- characteristics

The table, graph and characteristics settings are determined by the setting in the corresponding screen window in the sieving task.

The header information is pre-set in the sieving task and can be updated by the user at the beginning of every sieving.

When this command is selected, the print dialogue field appears and this is where you can enter the range of pages to be printed (if the report extends over several pages), the number of copies, the destination printer and other options for printer set-up.

5.1.7 Selection List of the Last Files

One of the last 4 sievings can be loaded here.

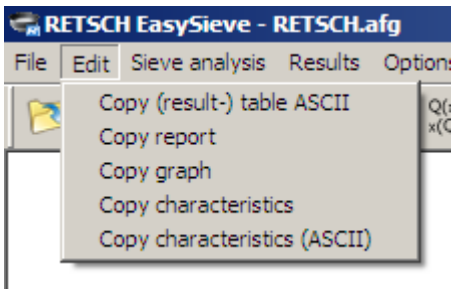
5.1.8 Exit

Once all sieving parameters have been set, you can start the sieving if you wish. Use this command to end your EasySieve session. Alternatively, you can select the **Close** command from the application's system menu.

5.2 Edit - Menu Commands

The Edit menu contains the following commands:

- Copy (result) table ASCII
- Copy print report
- Copy graph
- Copy characteristics
- Copy characteristics (ASCII)



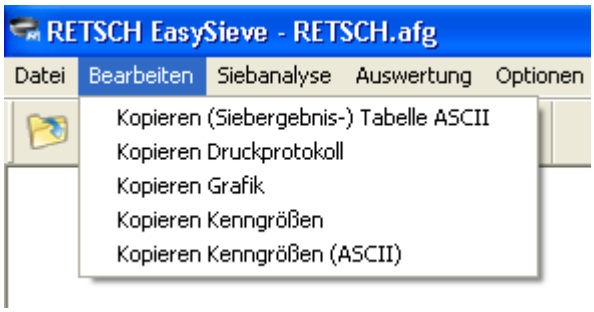


Fig. 7: Edit - Menu Commands

5.2.1 Copy (Sieving Result) ASCII Table

The values of x and Q3(x) are copied in text format into the clipboard in accordance with the sieve stack file set in the sieving task. The first line is the heading. The structure corresponds to the file in the Retsch file format: x is in mm and Q3(x) is entered between 0 and 1.

5.2.2 Copy Report

The print report is copied in Metafile format into the clipboard. It can then be pasted into other programs, e.g. into reports.

If the report is printed out then from other programs, which involves indirect printing via the clipboard, differences may arise compared to reports printed out directly from EasySieve. Such differences relate in particular to font size, line thickness and line forms.

5.2.3 Copy Graph

Copies the sieving results graph into the clipboard.

5.2.4 Copy Characteristics

The preselected characteristics are copied in Metafile format into the clipboard. The file name of the sieving is pasted for the purposes of identifying the sieving. Mean values are marked as such.

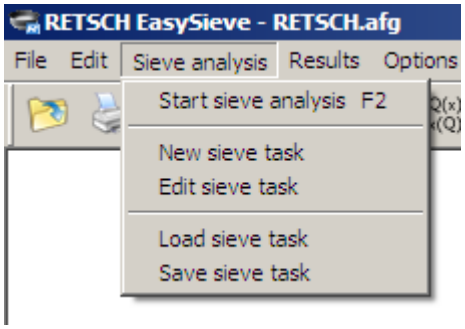
5.2.5 Copy Characteristics (ASCII)

The preselected characteristics are copied as ASCII text into the clipboard. All the report's header data are exported as well.

5.3 Sieving - Menu Commands

The Sieve analysis menu contains the following commands:

New sieve task	Creates a new sieve task
Edit sieve task	Edits a predefined sieve task.
Load sieve task	Loads a predefined sieve task.
Save sieve task	Saves the last changes



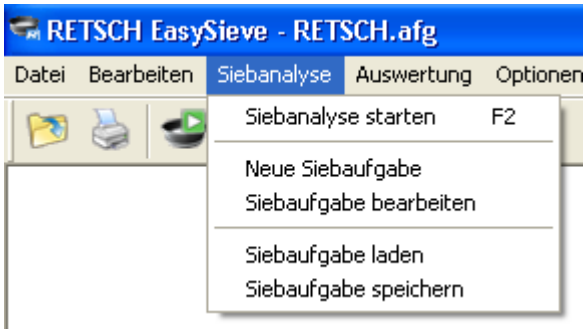


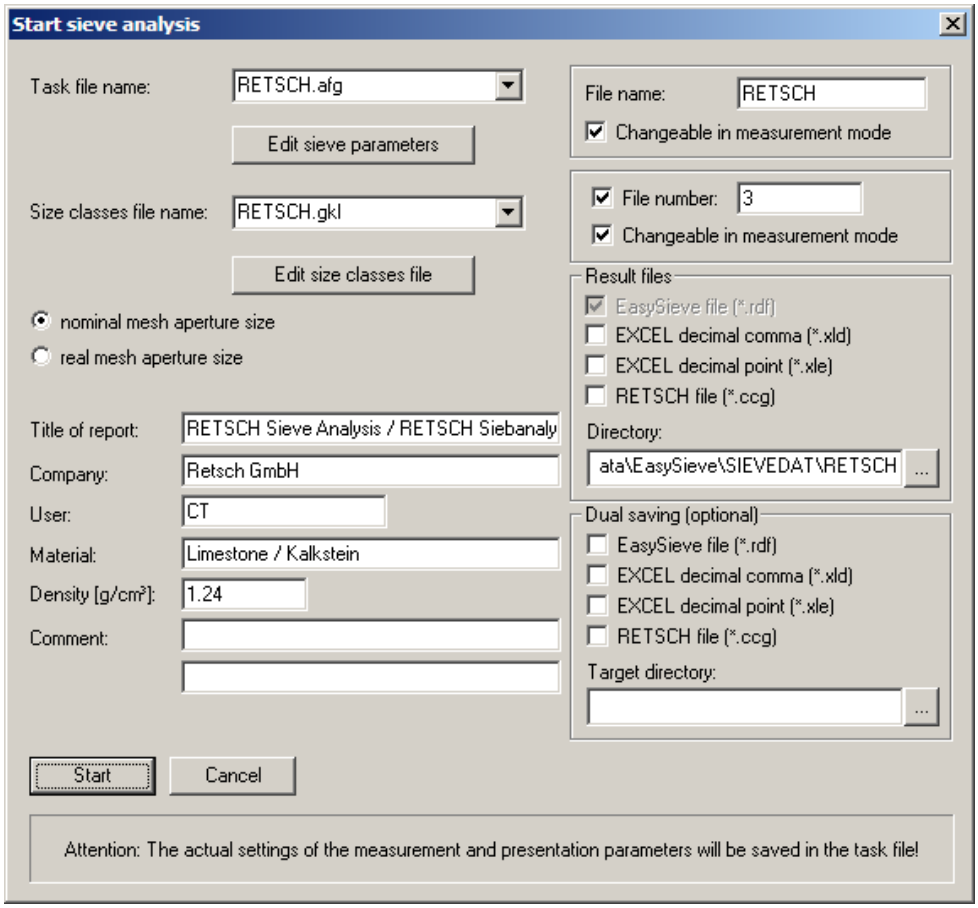
Fig. 8: Sieve Analysis Menu

5.3.1 Start Sieve Analysis

This command serves to conduct sieving with the aid of the parameters already set in the sieving task.

Once the “Start sieve analysis” menu item has been selected, the “Start sieve analysis” dialogue box appears.

This menu can also be started by simply pressing the F2 key.



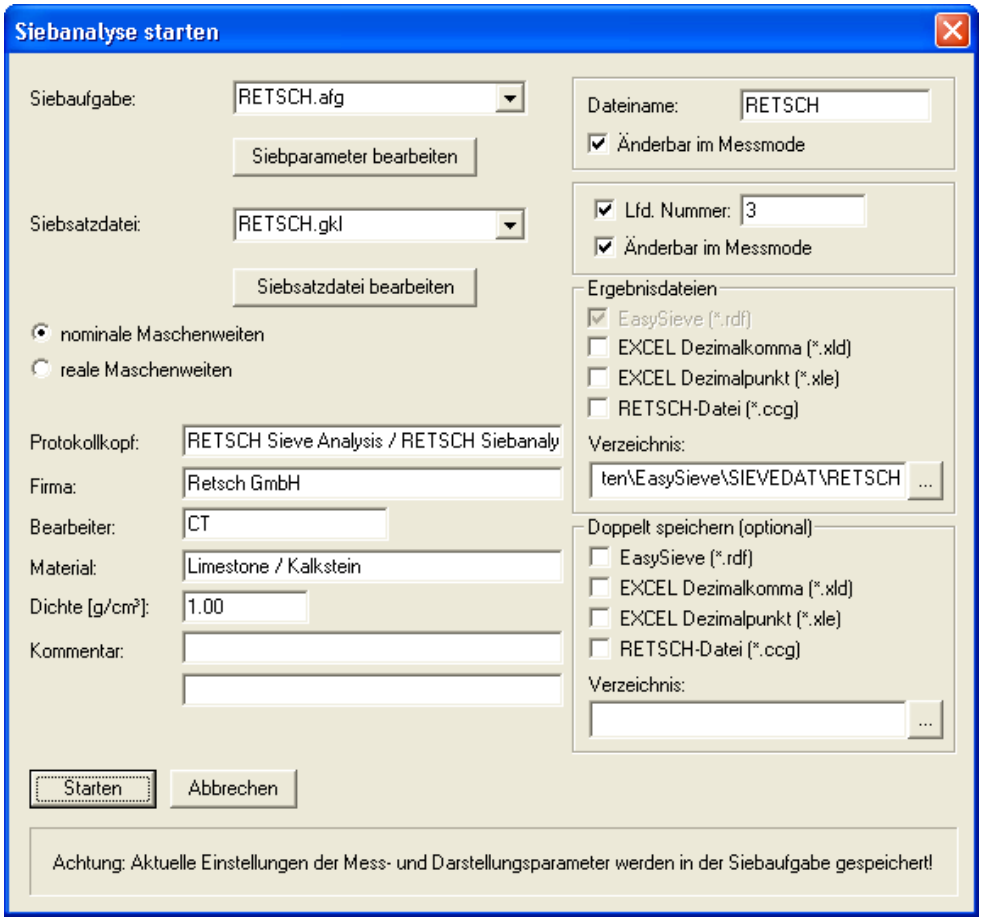


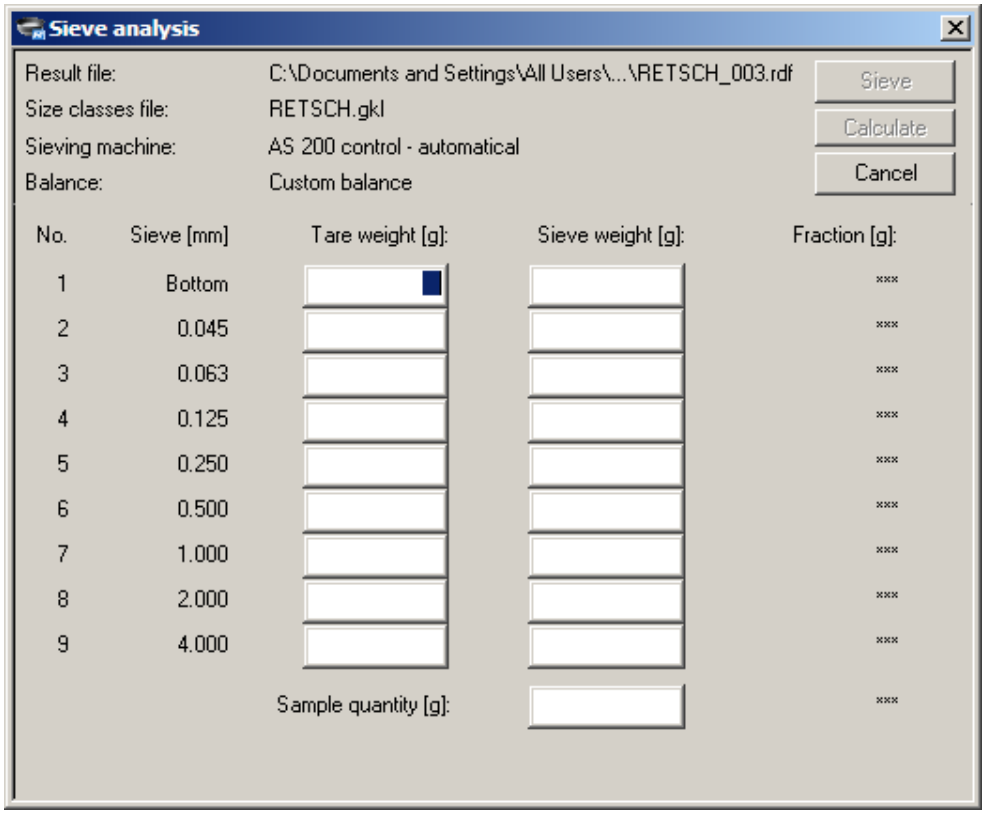
Fig. 9: Start sieve analysis

The setting options correspond to those described in Sieve Analysis – Sieving Task. First the settings saved in the sieving task (comments etc.) for report purposes and result storage are suggested. These should now be updated by the user as required to suit the sample to be analysed.

Likewise another sieve task or sieve stack file can be selected. If necessary, the sieving parameters can be changed or the sieve stack file edited.

When the “Start” button is actuated, the window changes to the “sieving” window.

The appearance of the window depends on the sieving machine being used (AS 200 control, AS 200 Tap, AS 300 control, AS 400 control, AS 450 control or AS 200 jet) and perhaps on the procedure (only AS 200 jet). When the AS 200 control, AS 200 Tap, AS 300 control, AS 400 control or AS 450 control sieving machines are selected, a window appears such as is shown in the following:



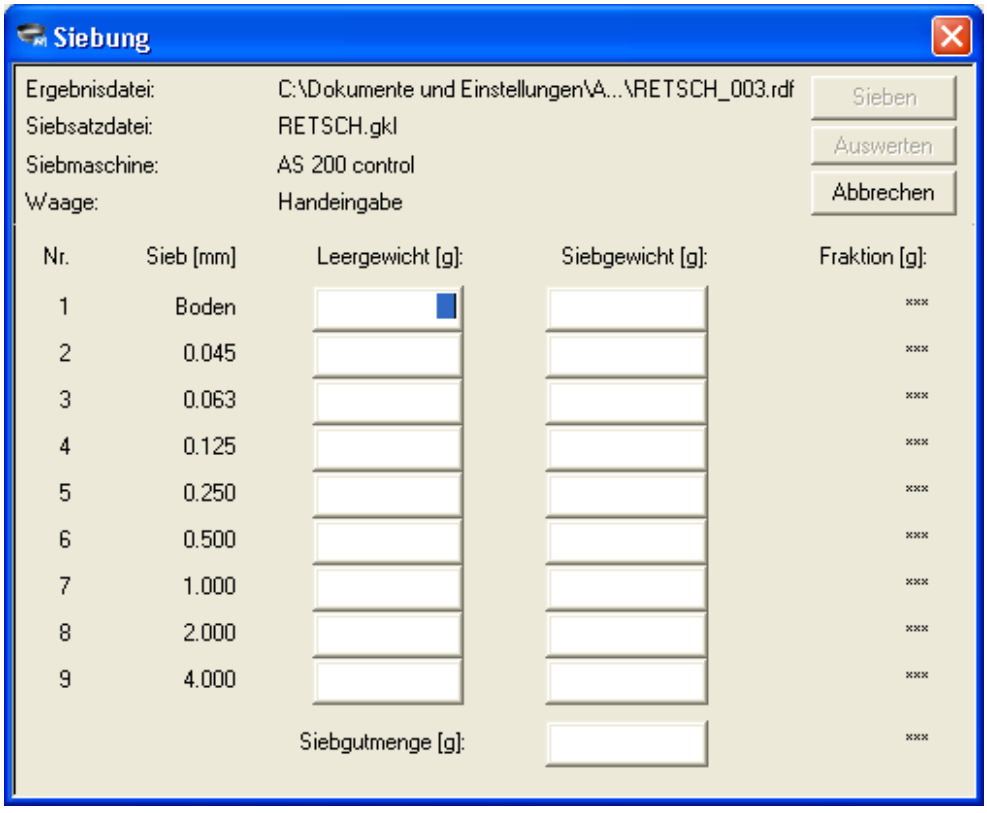


Fig. 10: “Sieving“ Window

When the AS 200 jet sieving machine is selected, the following query appears first:

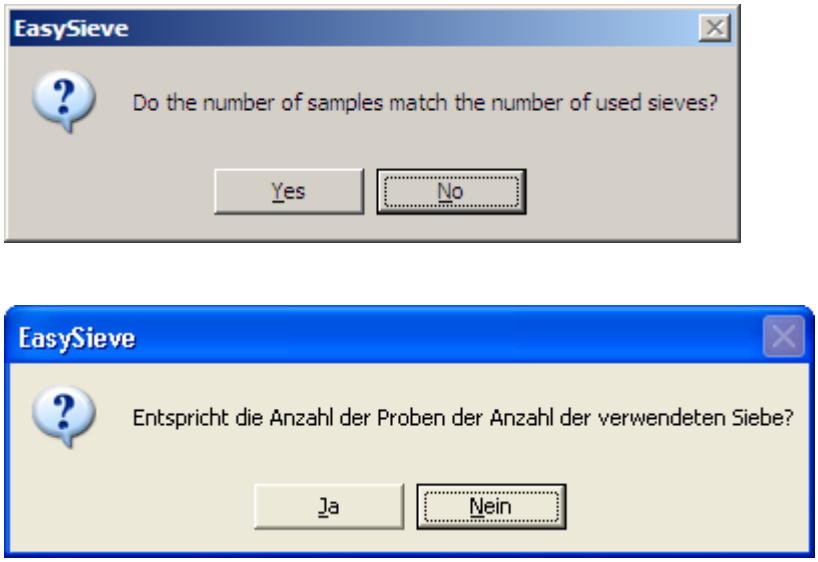


Fig. 11: Sieve query AS 200 jet

This question is used as the basis for deciding on the following procedure. If the answer is “yes”, the sieve analysis proceeds in accordance with what is known as the “Swiss procedure“, whereby a complete representative sub-sample of the material to be sieved is used for each mesh size. Ideally all sub-samples should have the same weight. If the answer is “no”, the sieving analysis proceeds in accordance with the “standard process”, whereby the oversized grains in the respective sieving must be quantitatively transferred to the following sieve and sieved further. Accordingly the quantity of the material to be sieved is only entered once and after that the software enters it automatically for the following sieving process after the deduction of one sieving run.

Information appears at the top of the window about the settings made in the sieving task for the balance and sieving machine. When automatic weight transfer is set, the weight is transferred automatically by actuating the weighing process on the balance.

In the following the tare weights of the sieves, the cumulated weight of the sample and the individual sieve weights after the sieving must be transferred or entered into the corresponding fields. The value at the balance is always transferred into the input box where the cursor is.

All fields are greyed out in the measuring mode because no manual changes may be permitted here. The active field here is marked with three asterisks. In this window the weight (only) is entered by data transfer from the balance.

Input of the tare weights:

If a sieving was conducted already for the selected sieve stack file, the fields are filled with the last tare weights. The user has the option of accepting these now. In that case the cursor must simply be positioned at the ““total weight” input field. If you wish to update the tare weights, these are entered or transferred, beginning with “bottom”, whereby the cursor advances automatically to the next field.

Input of the sieve load:

The total weight of the sample must be transferred / entered into this field. Once the sieve load has been inputted, it is no longer possible to change the tare weights. The prompt for starting sieving comes then.

Conducting the sieving:

Once the sieve load has been inputted, the program prompts the execution of the sieving process. It can also be started by pressing the *Sieve* key. A precondition for

this is that the tare weights and the sieve load are inputted completely depending on the selected sieving machine.

Input of the sieve weights after finishing sieving with AS 200 control, AS 200 Tap, AS 300 control, AS 400 control or AS 450 control:

At the end of the sieving process the cursor moves to the “sieve weight” input field for the coarsest sieve. Now one after another, from coarse to fine, the sieving back weights must be transferred or entered with the sample material remaining on the sieves. If the value transferred is lighter than the corresponding tare weight, a fault alarm is given.

Input of the sieve weights after the end of sieving with AS 200 jet:

At the end of the respective sieving process the cursor moves to the “sieve weight” input field for the respective sieve, from fine to coarse.

After the input of each value the calculated fractions are displayed.

Once all values have been inputted, the evaluation can be started by clicking on the “Evaluation “ button, whereby the files defined in the sieving task (*.rdf; optional *.xle, *.xld, *.ccg) are written and opened evaluation windows are updated. When sieving is conducted with the AS 200 jet sieving machine in accordance with the “Swiss procedure”, information appears once the “evaluation” key is pressed that the calculation is based on an averaged weight of all fractions used for sieving.

In addition, a check is run through for agreement between the total sieving residue and the inputted gross weight. A warning is given if the differences are > 2%.

5.3.2 New sieve task

Use this command for the quick generation of a new sieving task. All setting windows required to configure the sieving task are run through. No pre-initialisations by other sieving tasks are used.

By inputting a “file name”, you can quickly pre-initialise the name of the sieving task, the sieve stack file, the file directory for the sieving task and the names of the individual sieving files.

Once all sieving parameters have been set, you can start the sieving if you wish.

5.3.3 Edit Sieve Task

The currently loaded and most recently executed sieving task is opened for editing. All setting windows required for editing the sieving task are run through (“Next” key).

5.3.4 Loading the Sieving Task

From a list of all previously set up sieving tasks a set of parameters can be loaded for the sieving to be conducted. After confirmation by pressing the “start …” key, the “start sieve analysis” window appears in which the header data of relevance to the following sieving can be edited. When the “Edit …” key is actuated, the “Sieving Parameters” window opens and the pending sieve analysis can be edited in this window.

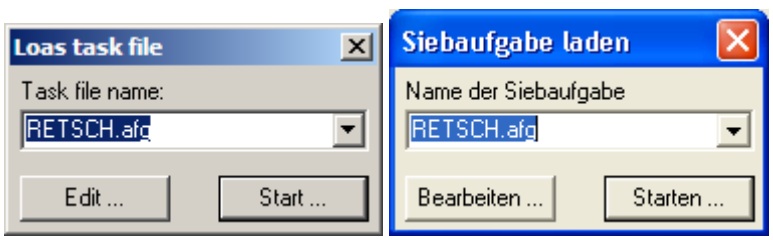
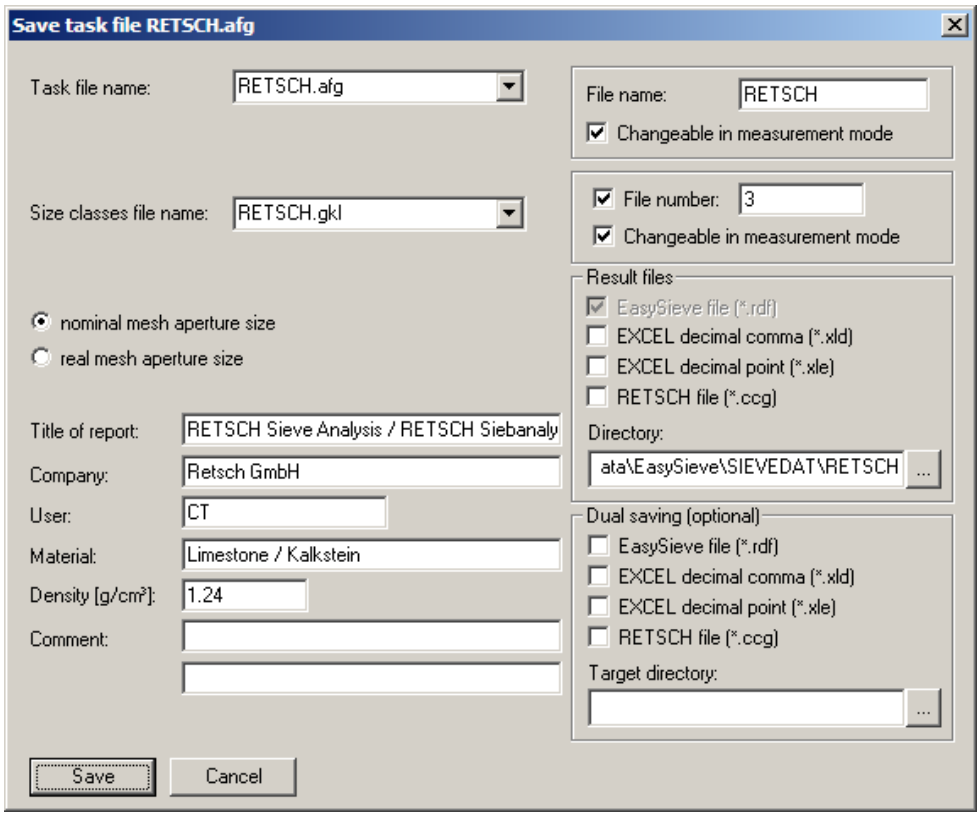


Fig. 12: Load sieve task

If alterations were made to a current sieving task and not yet saved, they can be saved now by means of the “Save Sieving Task” menu item, whereby some additional parameters can be set. The dialogue box that appears presents a summary of the essential settings for the sieving task.



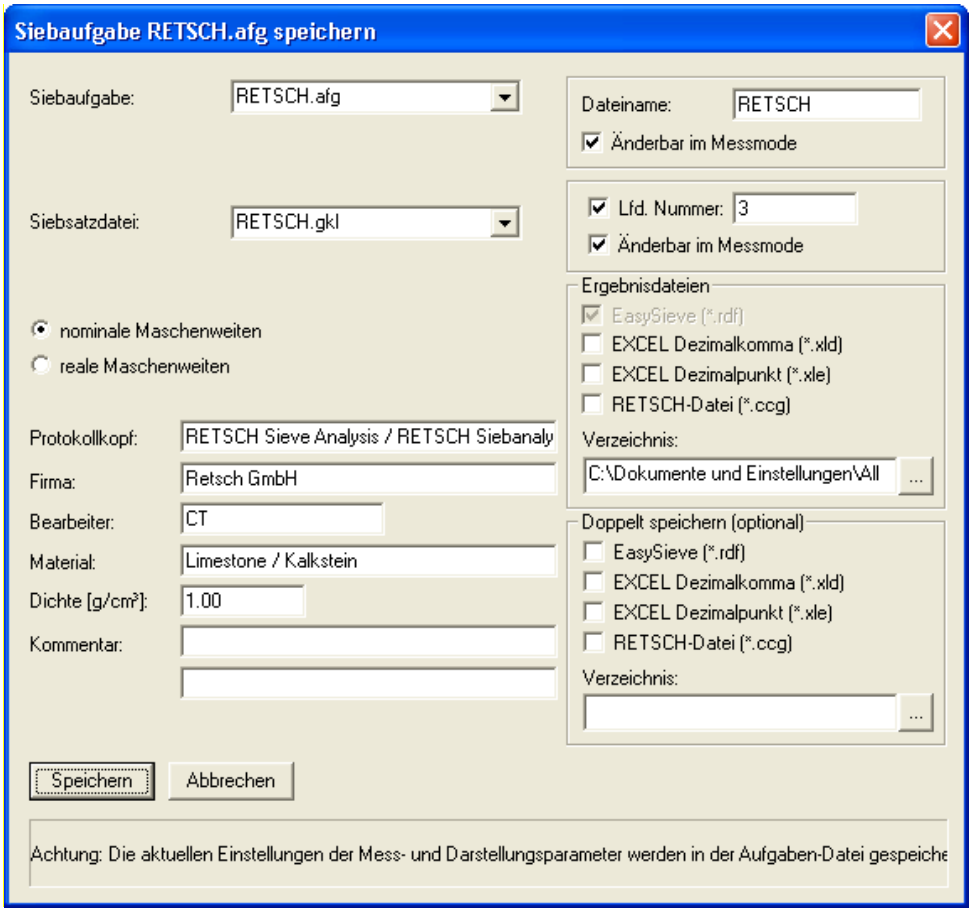
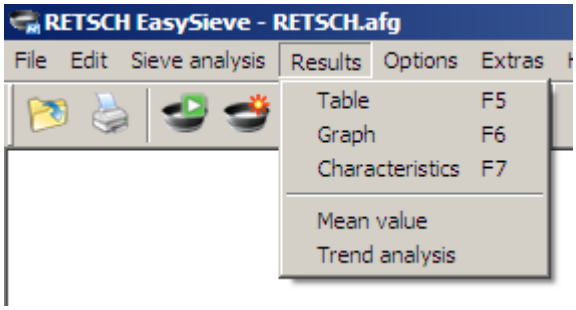


Fig. 13: Save Sieving Task

5.4 Evaluation – Menu Commands

The evaluation menu contains the following commands:

Table	Evaluation of sieving in tabular form
Graph	Evaluation of sieving in the form of a graph
Characteristics	Display of the sieving characteristics
Mean value	Formation of a mean value from several measurements
Trend analysis	Analysis of a trend from a number of individual measurements available for selection



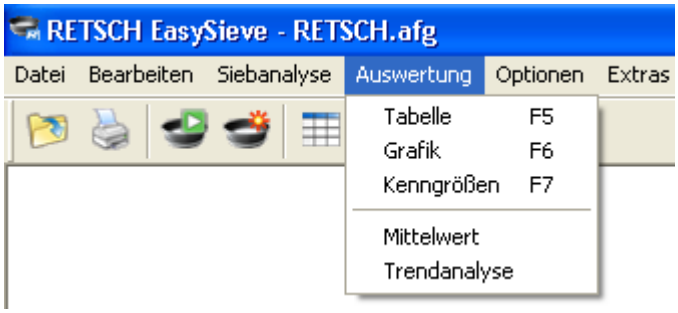


Fig. 14 4.4 Evaluation - Menu Commands

5.4.1 Table

Tabular presentation of the sieving results, showing a list of the grain size classes and the fractions found in them. The menu can be accessed more quickly by pressing the F5 function key F5 .

5.4.2 Graph

Presentation of the sieving results in the form of a graph. The abscissa displays the particle size and the ordinate shows whichever characteristic has been selected (Q3 and p3 are standard). The menu can be accessed more quickly by actuating the F6 function key.

5.4.3 Characteristics Settings

Tabular presentation of the characteristics. The menu can be accessed more quickly by clicking on the F7 function key.

5.4.4 Mean Value

This command serves to form the mean value of several sievings which were saved under one sieve task.

5.4.5 Trend Analysis

To monitor alterations in the particle size distribution, several sievings can be evaluated in a trend analysis.

5.5 Options - Menu Commands

The Options menu contains the following commands:

Alter the grain size limit	Definition of the largest and the smallest grain size
Sieving parameters	Setting sieving parameters
Edit sieve stack file	Creating and saving sieve stack files
Sieve stock	Creating and saving the sieve stock
Edit reference file	Creating and saving reference files

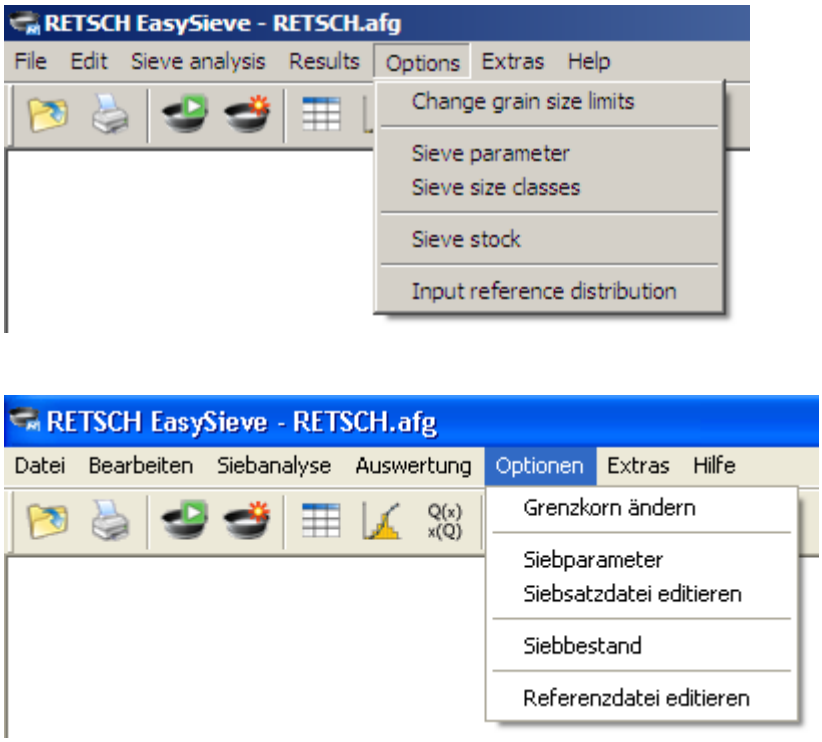


Fig. 15: Options - Menu Commands

5.5.1 Change Grain Size Limit

This menu item serves to change the grain size limit (lower and upper limits of particle size) in sievings already executed.

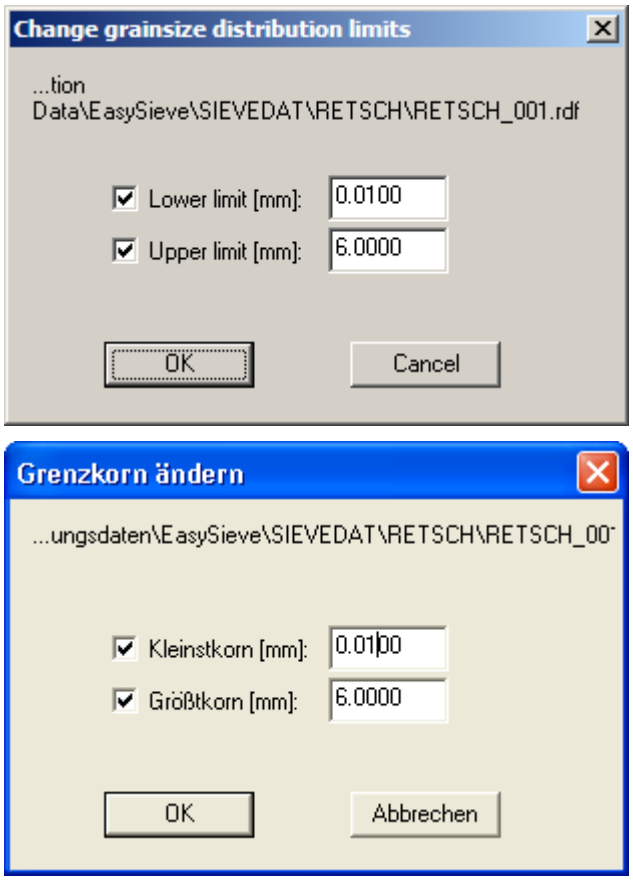


Fig. 16: Change grain size limit

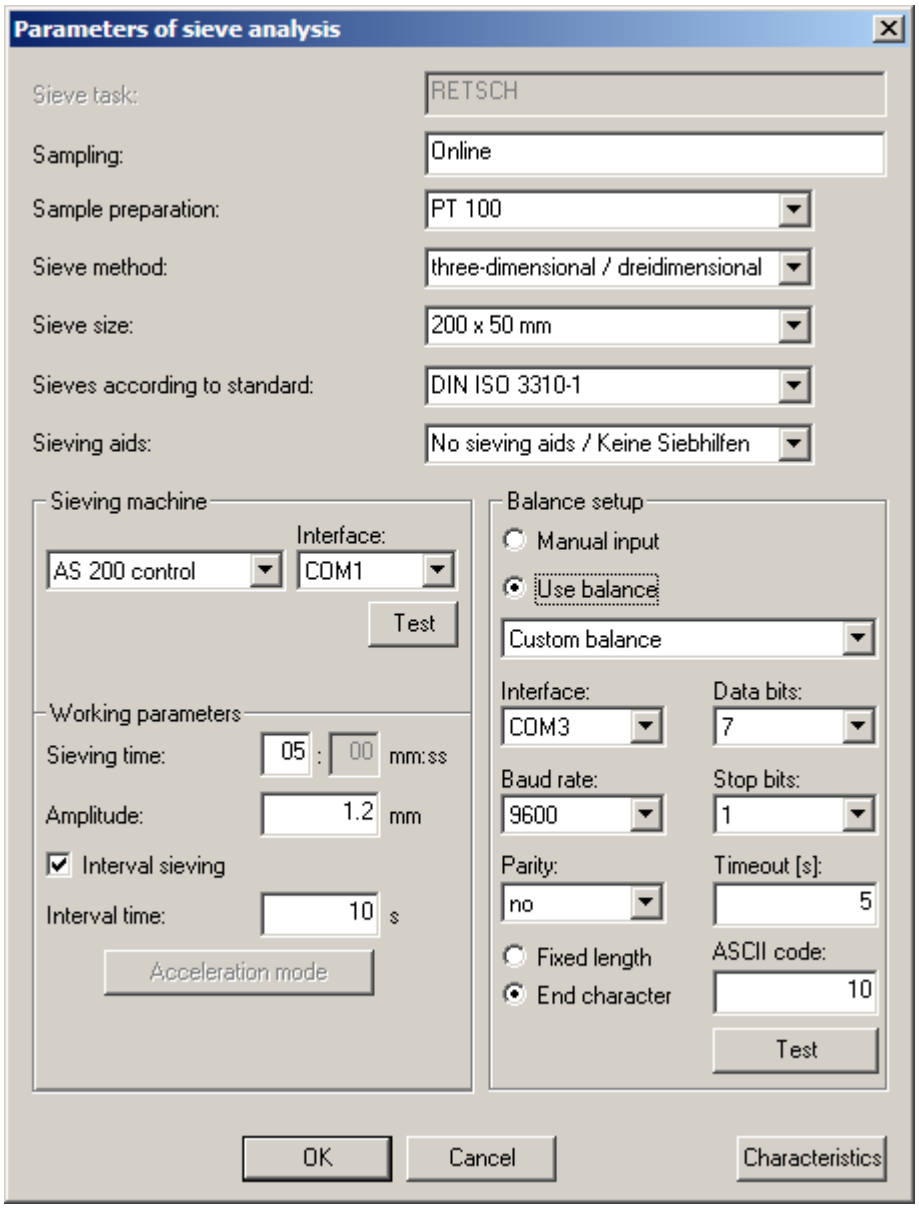
Alterations made relate to the sieving in the memory (i.e. the sieving that was last conducted or loaded by means of *Open – File*). This dialogue is exited by clicking on *OK* and any evaluation window that is opened is updated.

To change the rdf file permanently, it must be saved again then with the "*File - Save as"* command.

The inputs are not entered into the sieving task and the sieve stack file.

5.5.2 Sieving parameters

This command serves to set the sieving parameters. In particular the connected hardware (sieving machine, balance) is configured here.



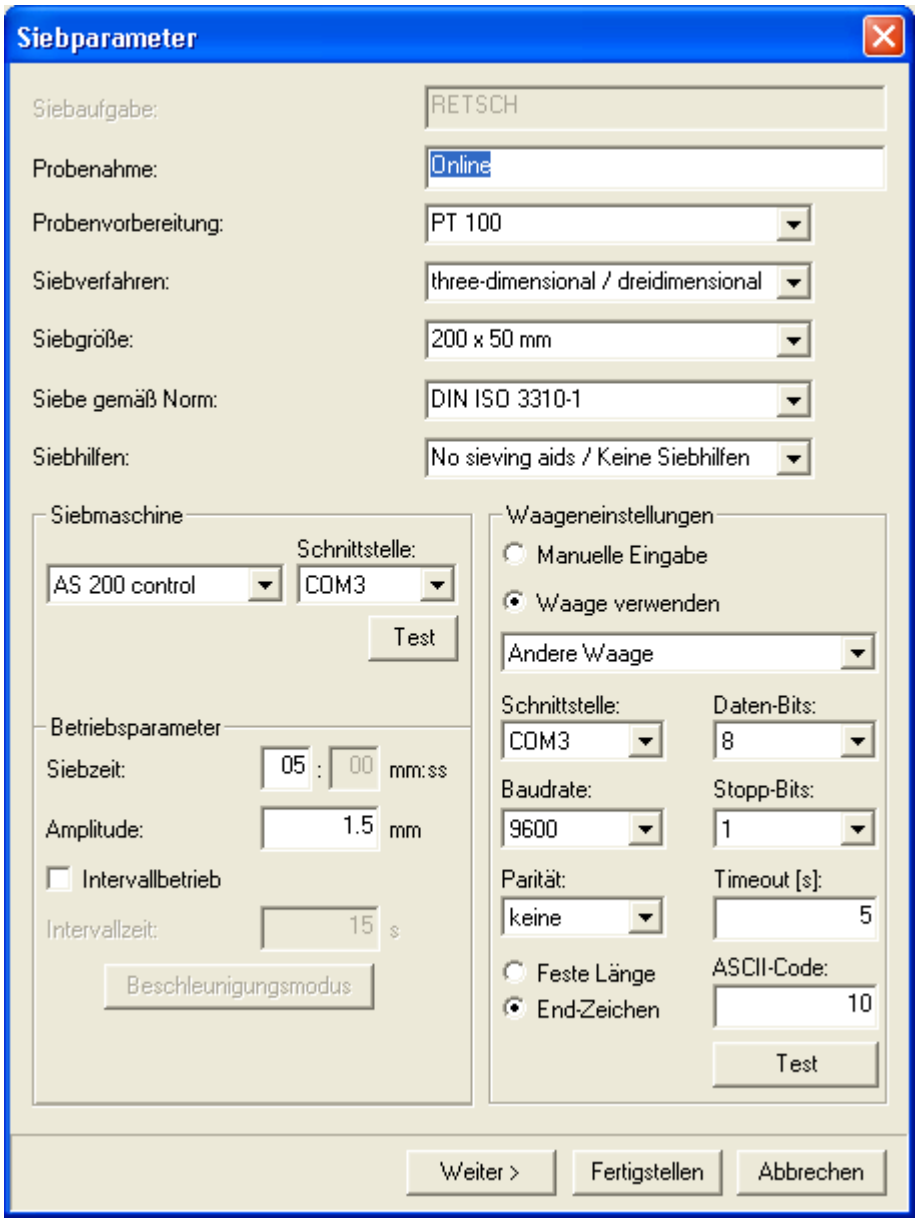


Fig. 17: Sieving Parameters Window

For documentation purposes in conformance to DIN 66141 the appropriate entries must be made in the

- **Sampling**
- **Sample preparation**
- **Sieving method**
- **Sieve size**
- **Sieving according to standard**
- **Sieving aids**

fields. To make inputting easier, preset texts can be used in most fields. The selected entries appear in the sieve report and in the characteristics window when “Edit”- “Display of Measuring Conditions “ are selected.

Sieving machine:

AS 200 control interface: the AS 200 control sieving machine is driven automatically by EasySieve. The serial interface can be selected by means of the settings.

AS 200 tap interface: The AS 200 tap sieving machine is controlled automatically by EasySieve. The serial interface can be selected by means of the settings.

AS 200 jet interface: The AS 200 jet sieving machine is controlled automatically by EasySieve. The serial interface can be selected by means of the settings.

AS 300 control interface: The AS 300 control sieving machine is controlled automatically by EasySieve. The serial interface can be selected by means of the settings.

AS 400 control interface: The AS 400 control sieving machine is controlled automatically by EasySieve. The serial interface can be selected by means of settings.

AS 450 Control Interface: The AS 450 control sieving machine is controlled automatically by EasySieve. The serial interface can be selected by means of the settings.

Other sieving machine: for documentation purposes the name of the sieving machine being used must be entered in the “designation” window in the sieve report.

Sieve time: Input of the sieving time in min:sec

Amplitude: Amplitude during sieving, adjustable for AS 200 control, AS 300 control and AS 450 control.

Speed: Speed during sieving for AS 200 jet and AS 400 control.

Open mesh/negative pressure: the “open mesh” function can be selected in addition for the AS 200 jet. In this case the speed is fixed at 10 rpm. If the sieving machine is equipped with pressure regulation, negative pressure can be selected in mbar too.

Sieve base acceleration [g]: as an alternative to the amplitude/speed, sieve base acceleration can be set in the AS 200 control, AS 300 control, AS 400 control and AS 450 control sieving machines.

Interval operation: interval operation can be switched on for the AS 200 control, AS 300 control, AS 400 control and AS 450 control sieving machines.

Interval time: Duration of the interval. Depending on the time entered in the time window (AS 200 control, AS 300 control and AS 450 control in sec, AS 400 in min) the sieving machine stops briefly and then begins again.

If the AS 200 control, AS 300 control and AS 400 control options are used, the sieving machine parameters are automatically transferred and set there.

Balance settings:

Manual input: The weights are entered by hand at the time of the sieving (sieving item menu).

Using the balance: The weight is inputted automatically by pressing the key on the Mettler balance.

Other balance: Another balance is used, which can output the weight through the serial interface. The connection can be freely configured by means of the settings.

The connection must be configured in conformance to the specifications given by the manufacturer or in accordance with the settings made on the balance.

The connection to the balance can be configured in the windows underneath.

Interface: Input of the number of the serial interface (COM no.) through which the connection was made to the balance. The COM interface must be configured at the balance in accordance with the works standard for the respective balance (data bits, baud rate, stop bits, parity).

TimeOut [s]: Time-out duration during the establishment of communication. If the Mettler balance is activated, the connection to the balance is checked when the sieving menu item is called up. The balance must respond within the set time-out duration. The time must be selected so that the balance will react within this time to a print command sent from a PC even if the data output is set *after standstill*.

The length of the signal can be set. If the “fixed length” is selected, the data length of the signal must be specified. If the “end character” is selected, the ASCII character must be defined with which the balance communicates the end of the data signal.

The preset communication parameters for balances from the Mettler and Sartorius makes: for Mettler and Sartorius balances different modes of communication can be selected from a list. Please check the operating instructions of your balance to see if it supports one of the pre-set modes of communication and then select it.

Use the “test” key to test communication with the balance.

5.5.3 Edit Sieve Stack File

This menu item serves to define sieve stack files. When it is called up, the “Edit sieve stack file” dialogue box appears.

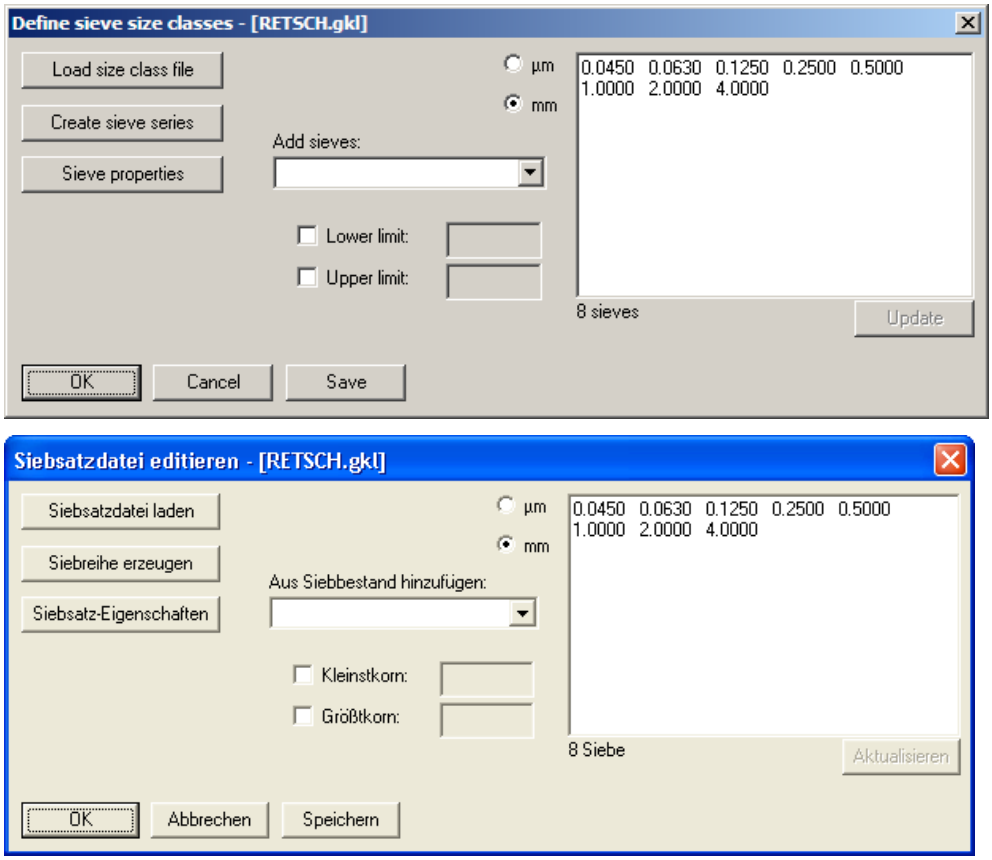


Fig. 18: Edit Sieve Stack File

Note:

If the sieve stacks are to be used for the next sieving, they must be saved in a file. This file must then be entered as a sieve stack file into the sieve task and saved.

If “µm” was selected, all values are displayed as µm and all inputs are interpreted as µm. Otherwise all sizes are specified in mm.

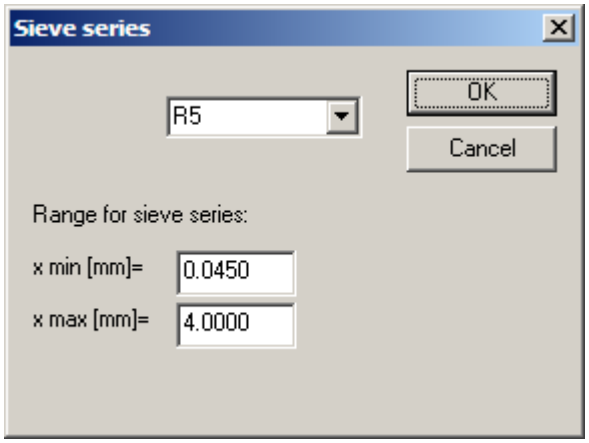
The following possibilities exist for quickly allocating the sieve sizes:

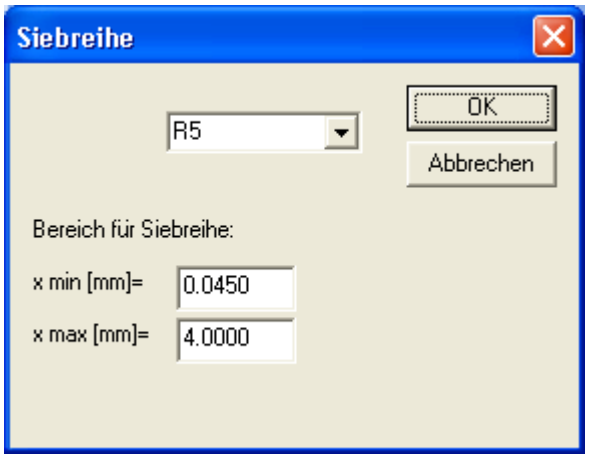
Reading the sieve stack file:

Reading an existing sieve stack file *.gkl

Creating:

The limits of the sieving series R5, R10, R20/3, R40, R40/3, ASTM Mesh, Tyler Mesh are set as desired between Xmin and Xmax.





In the free text window on the right side a sieve stack file can be edited freely. The individual mesh aperture sizes, separated by a space, are entered for this purpose. Inputs can be sequenced at will. The “update” key sorts the mesh aperture sizes in order of size. A maximum of 16 sieve sizes are possible.

If the sieving series was derived from ASTM Mesh or Tyler Mesh, it is only possible to delete individual classes or to reintegrate previously deleted ASTM or Tyler Mesh classes.

The following are optional entries:

Upper limit: Upper grain size limit of sieving

Lower limit: Lower grain size limit of sieving

Both variables are entered into the graphical evaluation only.

Sieve stack properties:

The properties of the individual sieves can be viewed in this menu item.

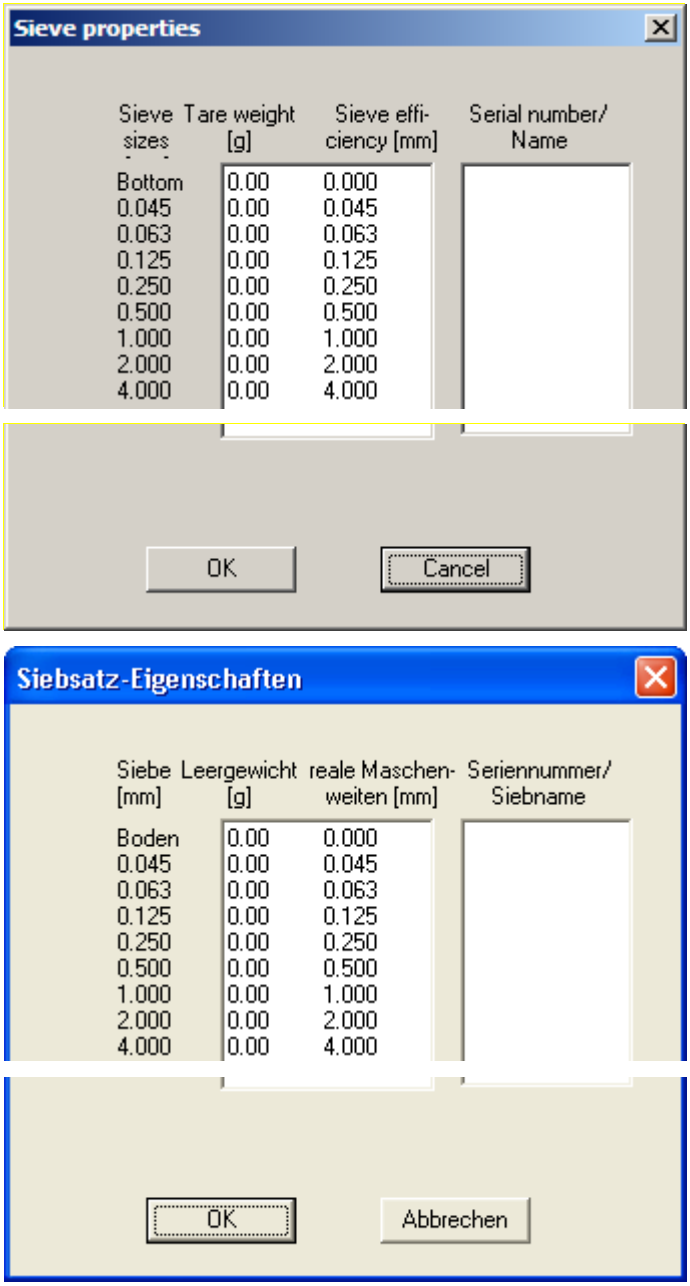


Fig. 19: Sieve Stack Properties

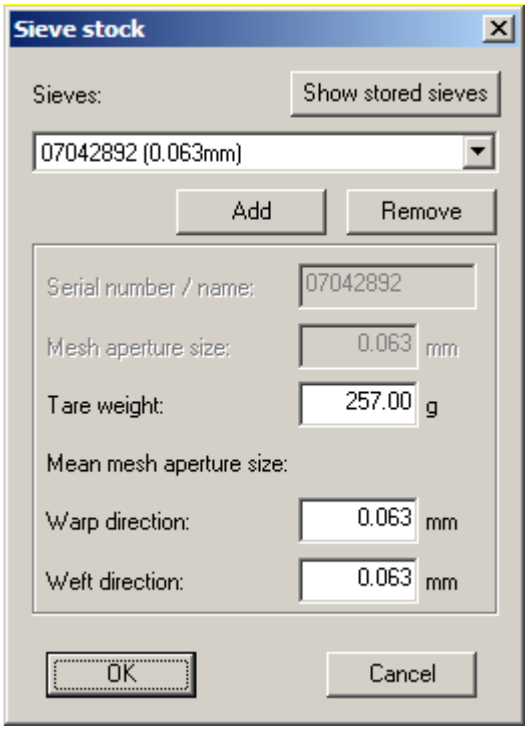
Add from sieve stock:

If “Options/Sieve Stock” sieves are filed in the menu item, they can be added to the sieve stack.

To save the sieve stack file, the “save” button must be actuated and a sieve stack file name must be entered.

5.5.4 Sieve Stock

The sieve stock menu permits the production and administration of a fixed stock of sieves.



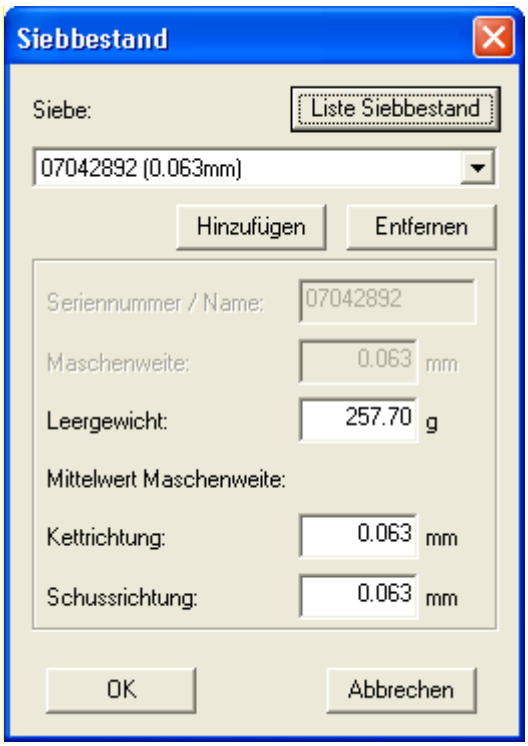


Fig. 20: Sieve stock window

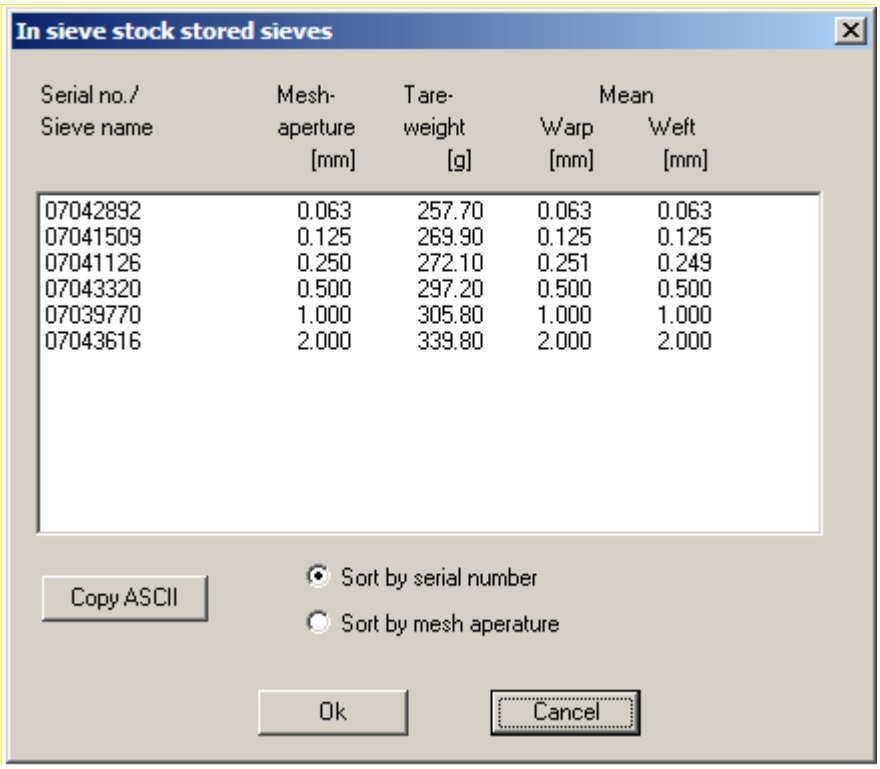
In addition to the sieve's mesh aperture, the sieve stock contains the sieve's tare weight and a clear identification (ideally the serial number). This makes subsequent sieving easy because it removes the necessity of weighing the empty sieve beforehand. It is essential for this that the sieve be cleaned thoroughly so that the exact tare weight is maintained.

Once the tare weight is inputted and – if known - the mesh aperture sizes in the warp and weft directions, the sieve can be integrated into the sieve stock by

clicking on the Add button. A name for the sieve and its nominal mesh aperture size are queried.

The Remove key deletes the highlighted sieve from the sieve stock.

The entire stock can be viewed in the “Sieve stock“ list and exported here as ASCII:



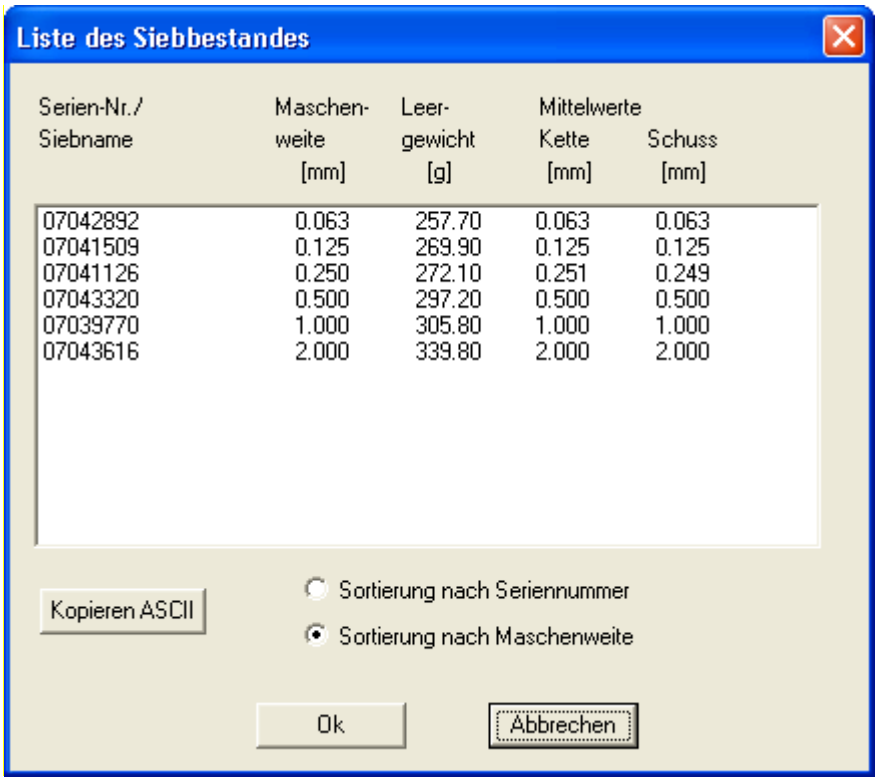
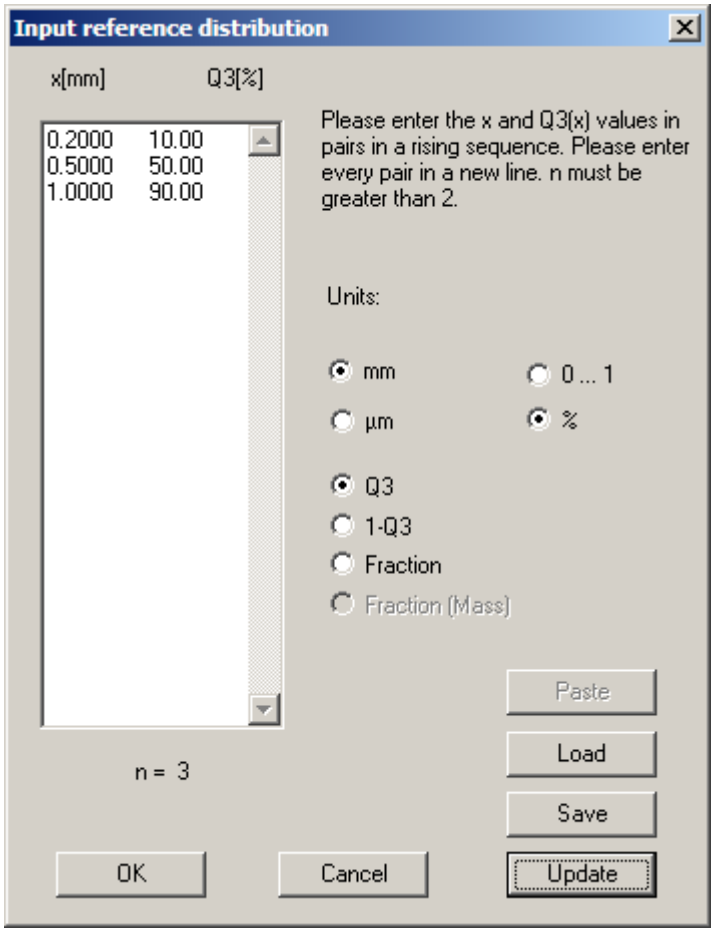


Fig. 21: Sieve Stock List

5.5.5 Edit Reference File

This menu item serves to create and save a reference file. A reference curve is a cumulative distribution of Q3 (x). It can be used as a comparison curve in the diagram.

The reference curve can be entered by means of the known distribution sums (Q3), residue (1Q3), fractions (p3) or masses. For this purpose the appropriate input method must be selected before beginning the input.



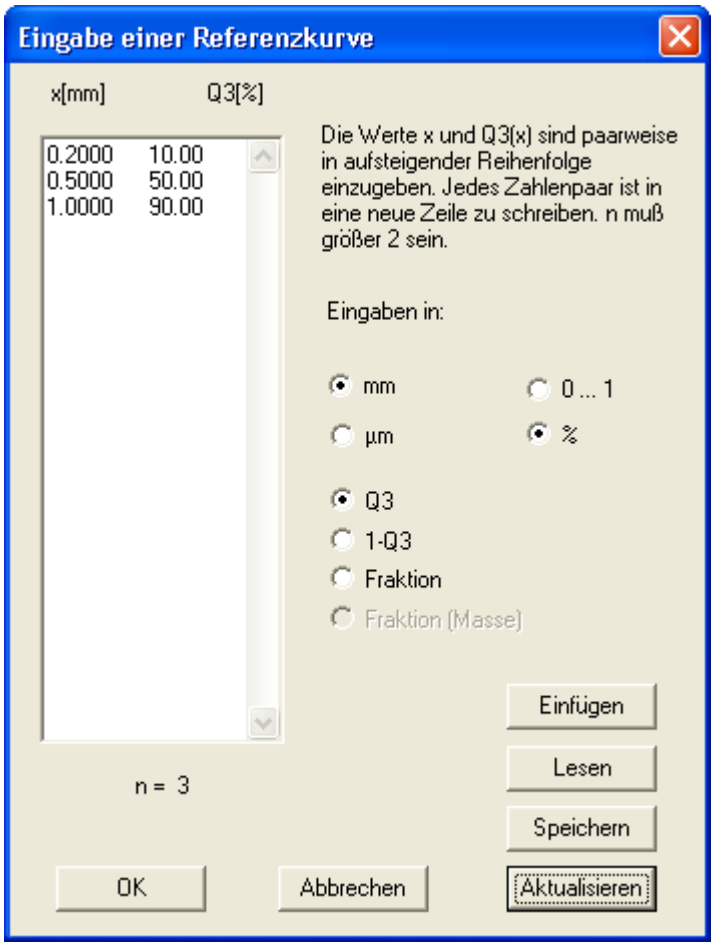


Fig. 22: Input of the Reference Distribution

The reference curve is inputted in two columns:

1st column:

X values (diameter) in ascending order with the input of Q3 and 1-Q3 and in descending order with the input of fraction or mass.

2nd column:

Q3 (x), 1-Q3, fraction and/or masses. When the p3 fractions are entered, the sum must be 1 and/or 100%.

When the dialogue box is opened, the editing field is still empty. Then the particle diameter x and the cumulative distribution of Q3 (x) can be entered in pairs, separated by a space. x must be entered in ascending order. After editing, the “Update” button should be actuated. The inputted text is then checked and reformatted.

The measurement units can be selected with the appropriate check boxes. If there are values in the editing field already, they will be converted and updated.

The “Paste” button allows data to be inputted in text format from the clipboard. This overwrites the existing data in the Edit box. The data in the clipboard must consist of two columns, containing x and Q3 (x), whereby x is rising. x can be specified in mm or in µm. Q3 (x) can be entered in % or without a measuring unit.

The “Load” button allows data to be loaded from a text file. The text data can be a reference file or a file in Retsch file format (*.ccg). It is also possible to load a text file created with a text editor. This file must consist of two columns, containing x and Q3 (x), whereby x is rising. x can be specified in mm or in µm. Q3 (x) can be

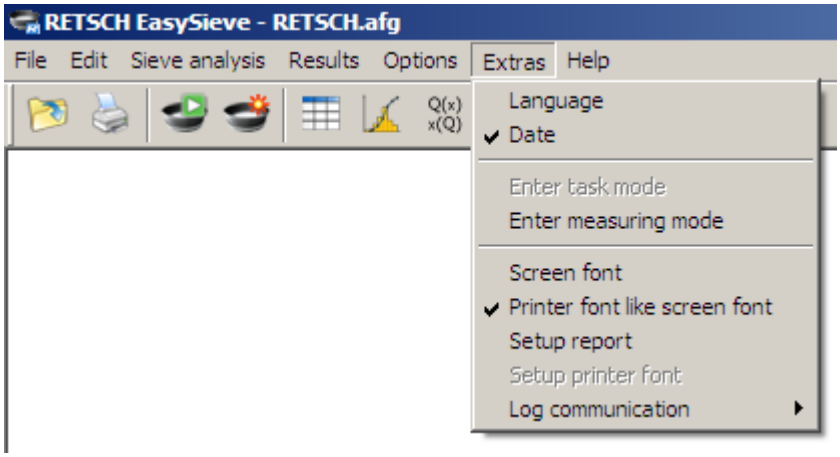
specified in % or without a measurement unit. When loading from a file, the existing data in the Edit box will be overwritten also.

Both when pasting from the clipboard and when reading text files, tabulators or spaces are interpreted as separators. Commas or points are interpreted as a divider in a decimal number.

5.6 Extras – Menu Commands

The Extras menu contains the following commands:

Language	Selection of the menu language
Date	Switches automatic date acceptance on or off
Enter task mode	All menu items are active
Activate the measuring mode	Only measuring and evaluating are possible
Screen font	Setting of font and font size for the evaluation windows
Printer font like screen font	Automatic adjustment of the printer font to the selected screen font
Set-up printer font	Setting of font and font size for the print report
Set-up report	Set-up of print report, integration of a customised logo
Communication log	Production of a log of the communication between EasySieve and balance and/or sieving machine



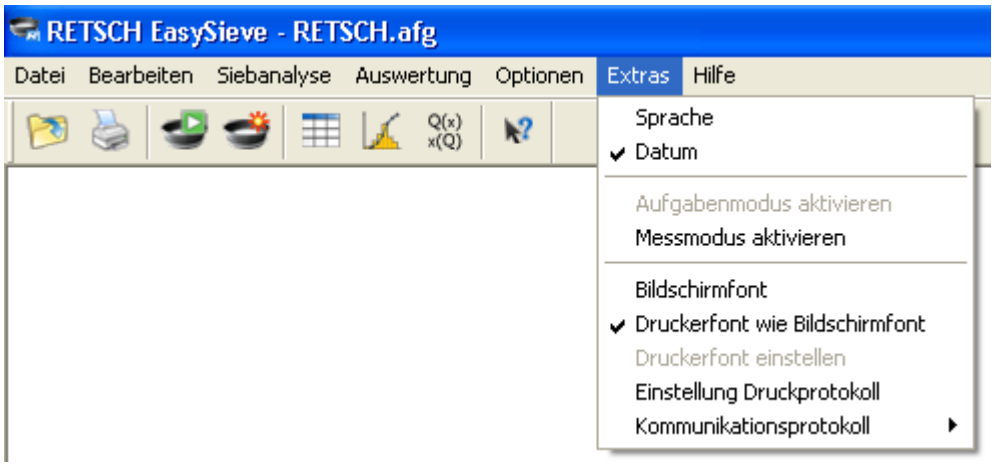


Fig. 23: Menu Commands Extras

5.6.1 Language

This menu is used to select the menu language. There is a choice between German and English menu prompting. A change in menu language does not become effective until the program is restarted.

5.6.2 Date

This command is used to switch automatic date acceptance on and off during measurements. If “Date” is activated (ticked), the date and time of sieving is transferred automatically and shown in the measurement log as well as in the characteristics window. When the date acceptance is deactivated, the appropriate fields remain free.

5.6.3 Activation of Task Mode

The task mode is always activated after installing the software. This menu item is therefore inactive. In task mode all menus are enabled and all parameters of relevance to sieving can be edited.

In the active measuring mode the task mode can be activated only when a valid password has been inputted. The standard password is “password”.

5.6.4 Activation of the Measuring Mode

To prevent parameters being altered unintentionally, the software can be put into measuring mode. In this mode the user can only conduct measurements and make evaluations.

If the “Activate measuring mode” menu item is selected, the user is asked to input and confirm a password for returning to the task mode.

Note: Please be careful with passwords to prevent abuse and unwanted software disablements.

5.6.5 Screen Font

This menu item is used for selecting the fonts for the evaluation windows. The selected set-up is saved and is also available for calling up the following programs.

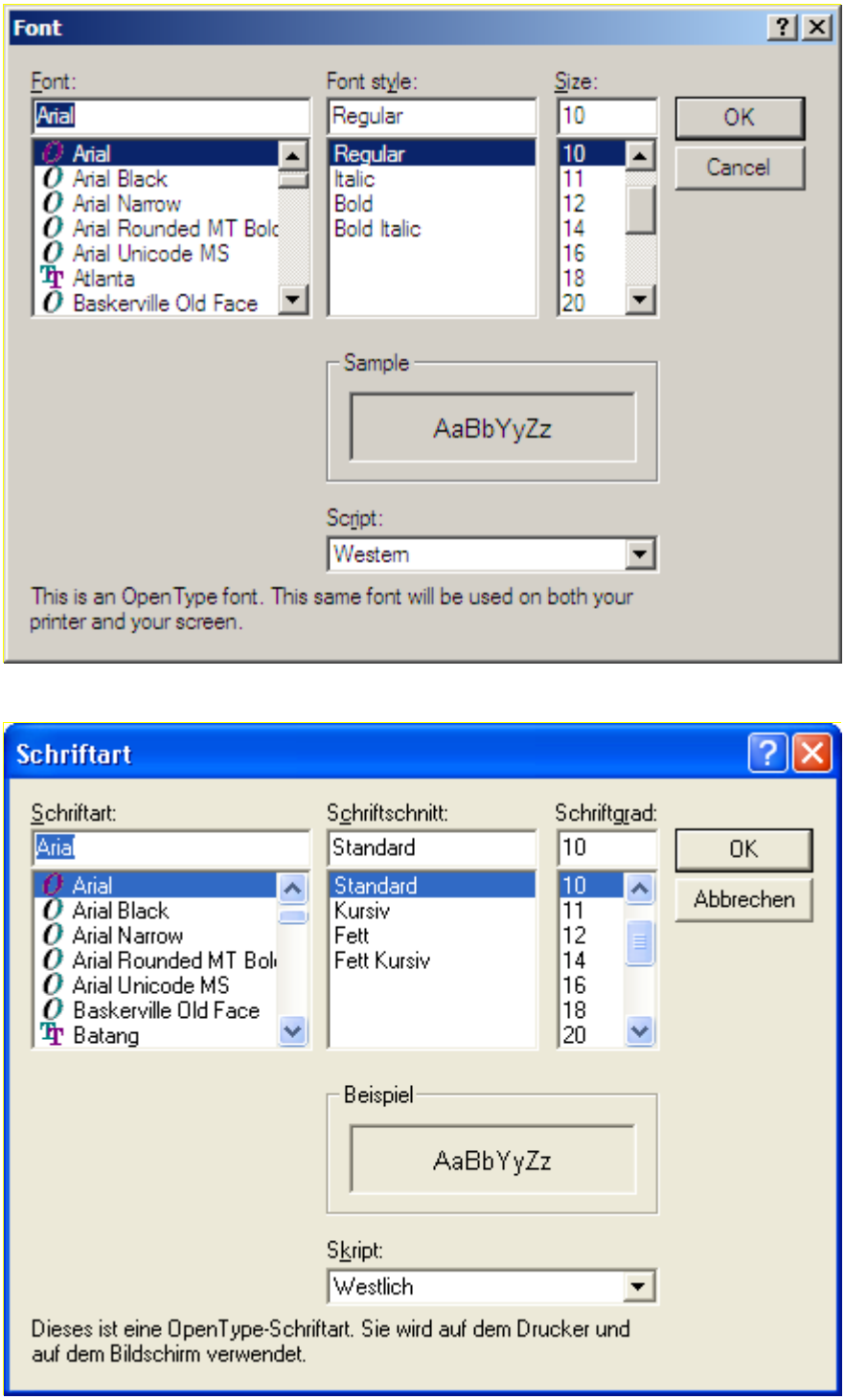


Fig. 24: Choice of font for the evaluation window

To avoid text overlapping, it is advisable not to choose too large a font in the display. The standard font is Arial, regular font style and size 8.

5.6.6 Printer font like screen font

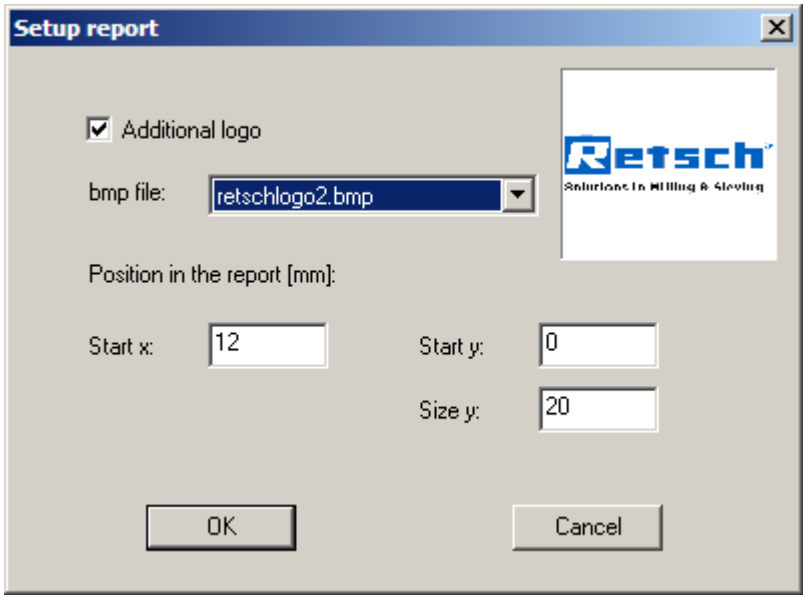
By setting this option, the printer font is adjusted automatically to the screen font. The “set printer font” menu item cannot be selected then.

5.6.7 Set Printer Font

This menu item is used for choosing the font for the print report. The selected set-up is saved and is also available for calling up the following programs.

5.6.8 Set up report

This menu item is used to set up the print report. A customised bit-map file (company logo) can be integrated into the report.



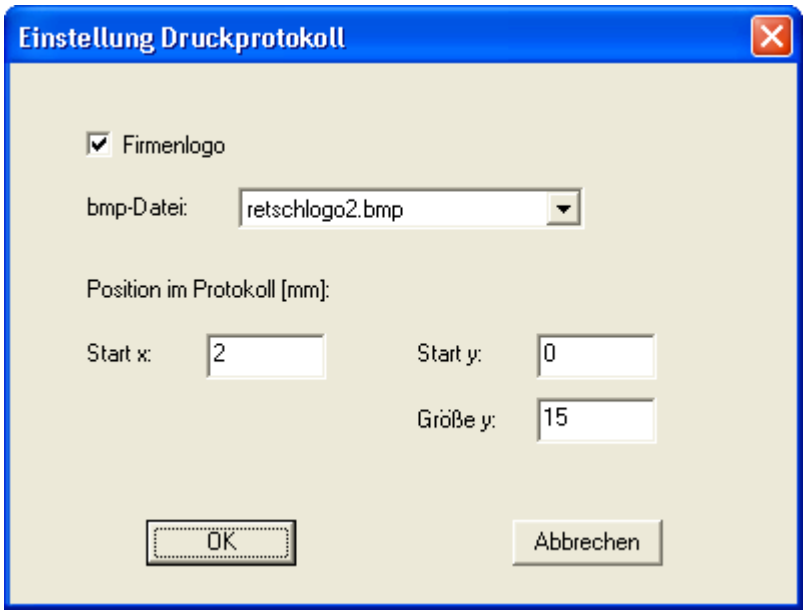


Fig. 25: Set-up of print report

The logo to be integrated must be available as a 256-colour bitmap and be filed in the program directory (C:\Programs\EasySieve). It is inserted into the top left of the print report. The exact position and size are adjusted by means of the following parameters.

Start x X position in the report of the upper left corner of the logo [mm]

Start y Y position of the upper left corner of the logo [mm]

Size y size of the bit-map in the report [mm] (y direction, the size is changed proportionally in the x direction)

5.6.9 Communication log

This menu item is used to set up a log of communication between the software and the sieving machine and/or balance to support the communication facility. To produce the respective report, a tick is made before the sieving at the respective device.

The report is filed in the …. folder.

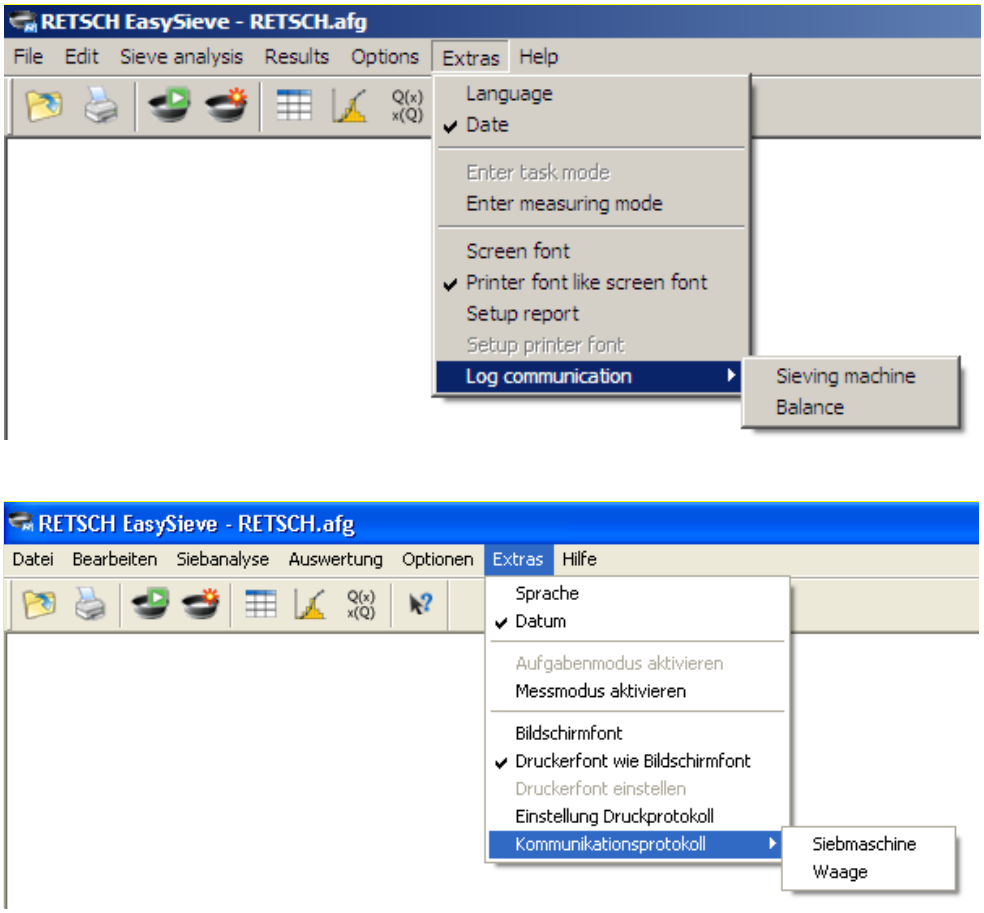


Fig. 26: Set-up of Communication Log

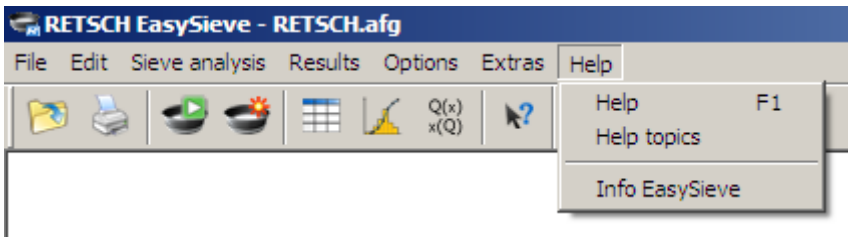
5.7 Help - Menu Commands

The Help menu contains the following commands to assist you in this application:

Help Display of the EasySieve help index

Help topics Displays the directory of the themes for which help is available

Information on EasySieve Shows the number of this application version



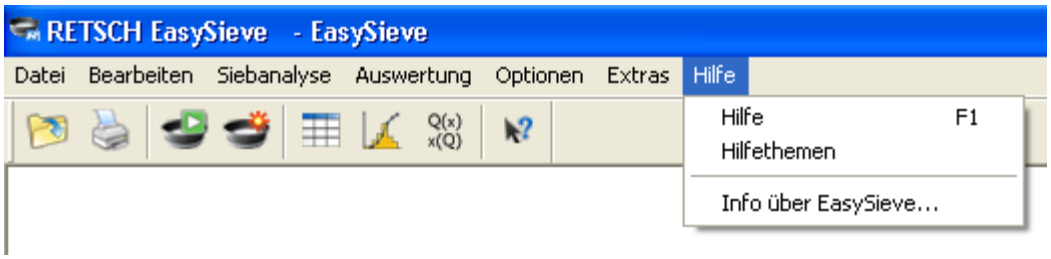
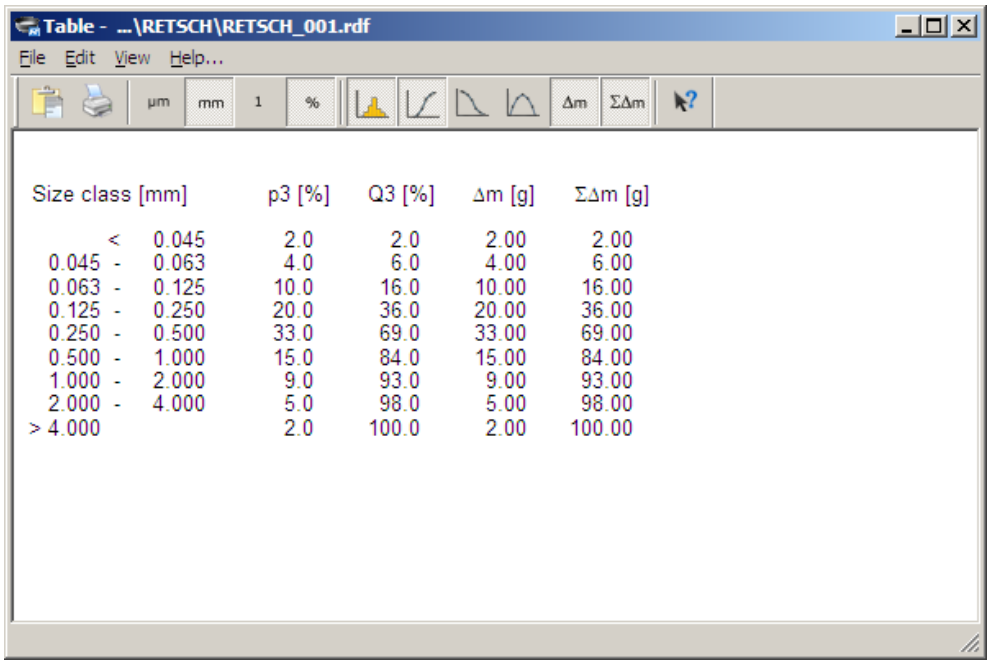


Fig. 27: Menu Commands Help

6 Table Window - Description of the Menu Items

The table window serves to show the sieving results in tabular form. The p3 (fraction), Q3 (distribution), 1-Q3 (residue), q3 (density), Δm (mass of the sieving residue) and ΣΔm (gross mass residue) variables can be shown.



Size class [mm]	p3 [%]	Q3 [%]	Δm [g]	ΣΔm [g]
< 0.045	2.0	2.0	2.00	2.00
0.045 - 0.063	4.0	6.0	4.00	6.00
0.063 - 0.125	10.0	16.0	10.00	16.00
0.125 - 0.250	20.0	36.0	20.00	36.00
0.250 - 0.500	33.0	69.0	33.00	69.00
0.500 - 1.000	15.0	84.0	15.00	84.00
1.000 - 2.000	9.0	93.0	9.00	93.00
2.000 - 4.000	5.0	98.0	5.00	98.00
> 4.000	2.0	100.0	2.00	100.00

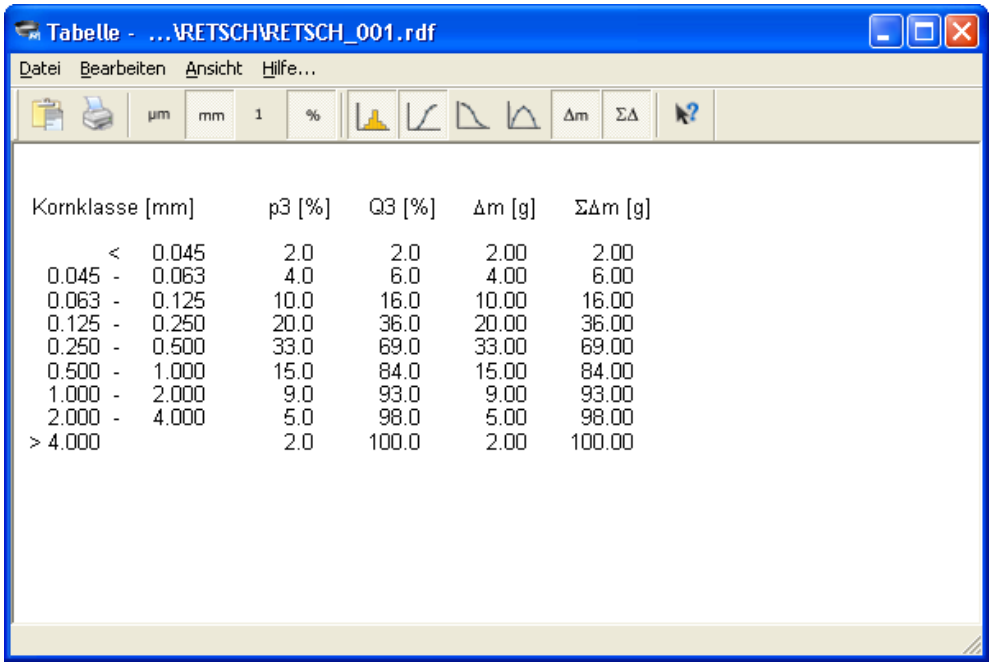
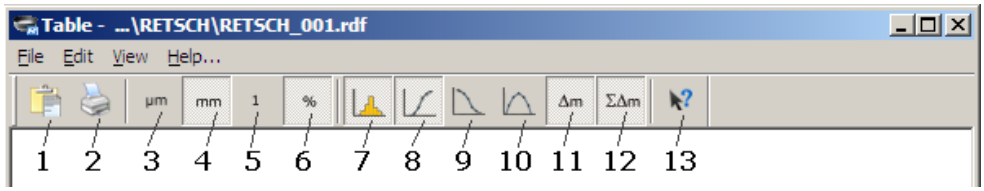


Fig. 28: Presentation of the sieving results in tabular form

The following table presents a summary of the toolbar buttons in the table window. If the button corresponds to a menu item, the menu item is specified beside it. Otherwise the function of the button is described in brief.



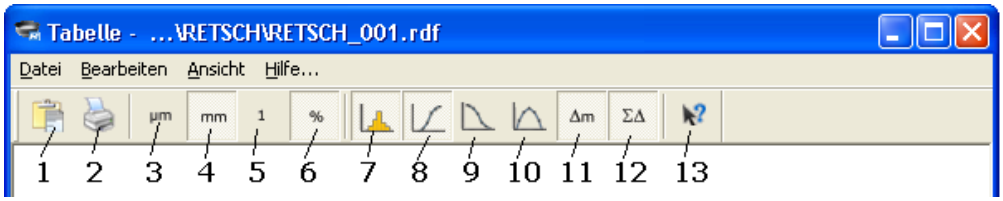


Fig. 29: no. of the button

No. of the button	Menu item / function
1	“Edit” - “Copy”
2	“File” - “Print.”
3	Display of grain size class in µm
4	Display of grain size class in mm
5	Display of results from 0-1
6	Display of results in percentages
7	Presentation of the p3 fractions in columns
8	Representation of the Q3 cumulative distribution in columns

9	Representation of the 1-Q3 cumulative residue in columns
10	Representation of the q3 density function in columns
11	Representation of the mass fractions in columns
12	Presentation of the cumulated mass in columns
13	Help

6.1 File - Menu Commands

6.1.1 Print Table

The measurement table displayed on the screen is printed out. In the printed image the file name of the measurement is put in front of this table.

The font and font size of the printed table is decided by the set-up in the “Extras” – “Screen font” menu item.

6.1.2 End

The table window is closed. If any of the alterations made to the table settings are to be effective in subsequent measurements too, the sieving task must be saved again now (see “Sieve analysis” - “Save sieving task”).

6.2 Edit - Menu Commands

The Edit menu contains the following commands:

Copy Copies the displayed table window into the clipboard

Copy (ASCII) Copies the table contents as ASCII text into the clipboard



Fig. 30: Menu commands Print

6.2.1 Copy

The table window presented on the screen is copied in Metafile format into the clipboard. The file name of the measurement is pasted to identify the measurement or when mean values are being produced, the table is identified as a table of mean values.

6.2.2 Copy (ASCII)

The data in the table is copied as ASCII text into the clipboard.

6.3 View - Menu Commands

The View menu contains the following commands:

Set-ups shown. Opens the selection window for the properties that are to be

Units Allows the units to be selected.



Fig. 31: Menu Commands View

6.3.1 Set-ups

This menu item summarises the essential setting possibilities in the table window.

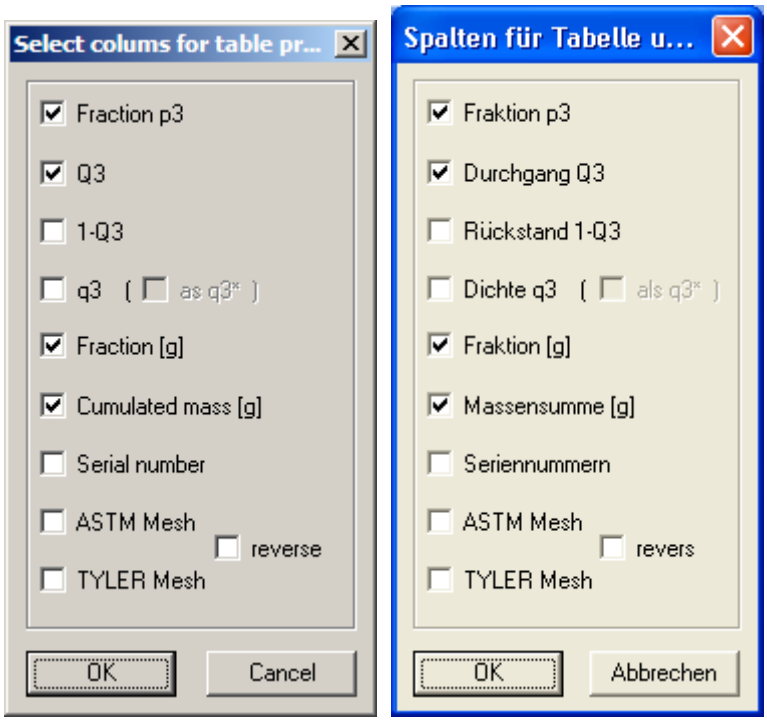


Fig. 32: Setting possibilities in the table window

You have the option of making the settings with the aid of this dialogue box or (with the exception of the serial numbers, ASTM Mesh, Tyler Mesh and reverse settings) with keys 3-12 in the toolbar.

The serial numbers setting allows tracing to a sieve when the serial number is known. This option is usable only if sieves are used from the sieve stock which are filed there with a serial number.

The ASTM Mesh and Tyler Mesh settings add information to the table on the mesh number in accordance with the ASTM or Tyler systems.

The reverse setting inverts the table so that the results are not in ascending mesh aperture size but displayed in a descending mesh aperture size instead.

6.3.2 Measuring Units

This menu item summarises the settings for the measuring units in the table window. There is a choice between having the grain size displayed in µm or mm. The totals and fractions are presented in a choice of normalisation to 1 or in %.

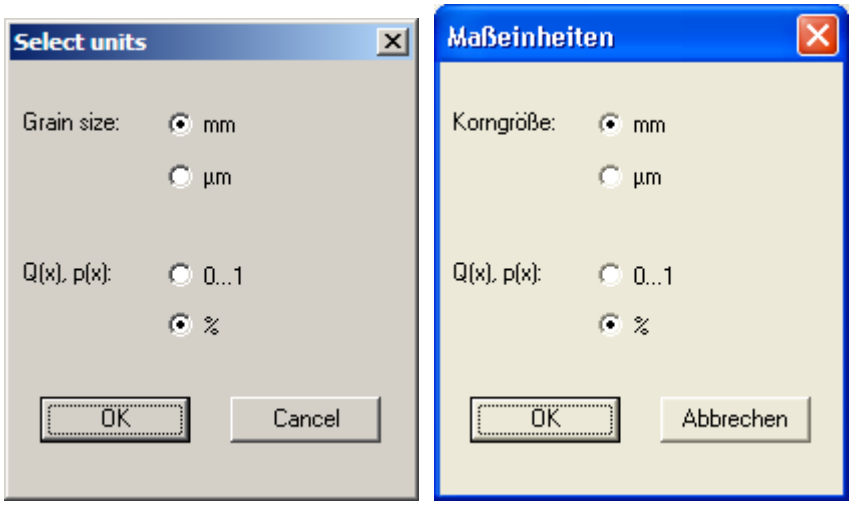
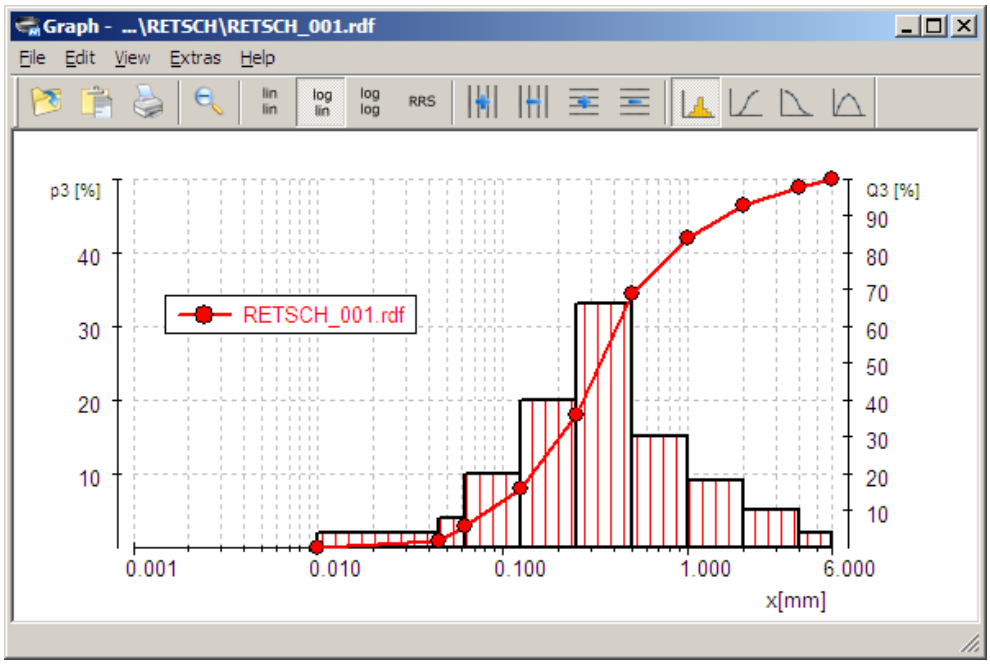


Fig. 33: Measuring Unit Settings in the Table Window

7 Graph - Description of the Menu Items

The graph is the graphical representation of grain size distributions measured with EasySieve or formed as mean values of several measurements.



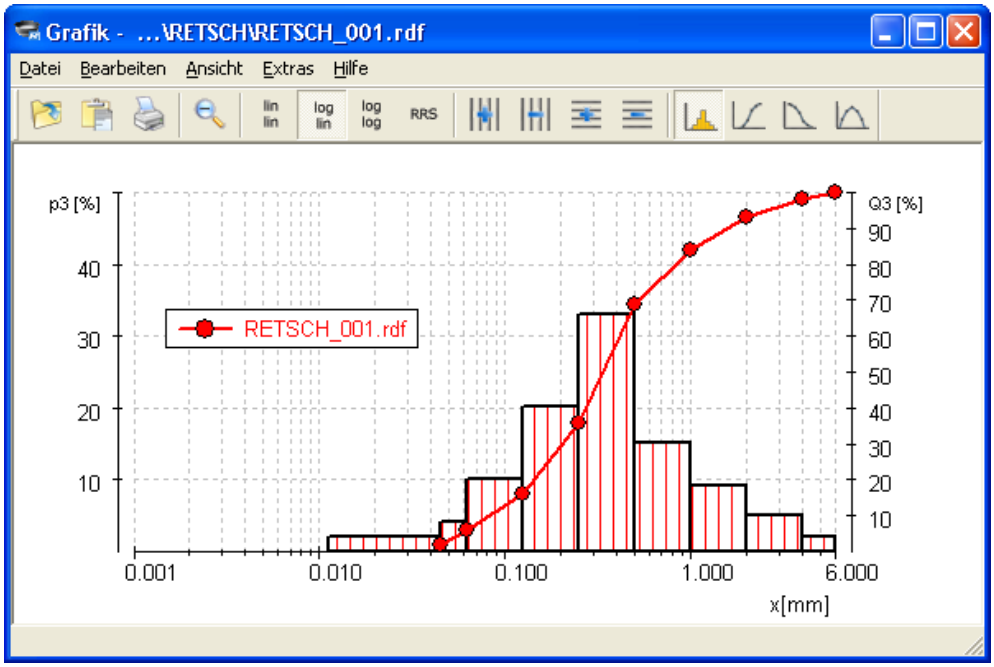


Fig. 34: Graph of the Grain Size Distributions

The file name of the presented measurement is given in the header. If mean measurements are presented, this is indicated by the “mean value” marking.

There are a maximum of two ways of presenting the measurement results in a graph. The following can be represented: p3 (density), Q3 (distribution), 1-Q3 (residue), q3 (density). For this purpose two y axes can be configured.

When the diagram is called up, the x axis is set to register the current measuring range of the sieving. However, it is also possible to choose fixed limits, whereby the graph is presented of a range between the inputted variables.

The x display area can be reduced by right dragging over the area of interest (zoom function). It must be noted here that the area marked in this way is extended to the degree that the size classes it encompasses can be displayed completely.

The display range can be increased again by repeatedly clicking on key 4 “Zoom” in the toolbar.

The following table shows a summary of the buttons in the toolbar of the graph window. They are numbered from left to right. If the button corresponds to a menu item, it refers to it. Otherwise, the function of the button is described in brief.

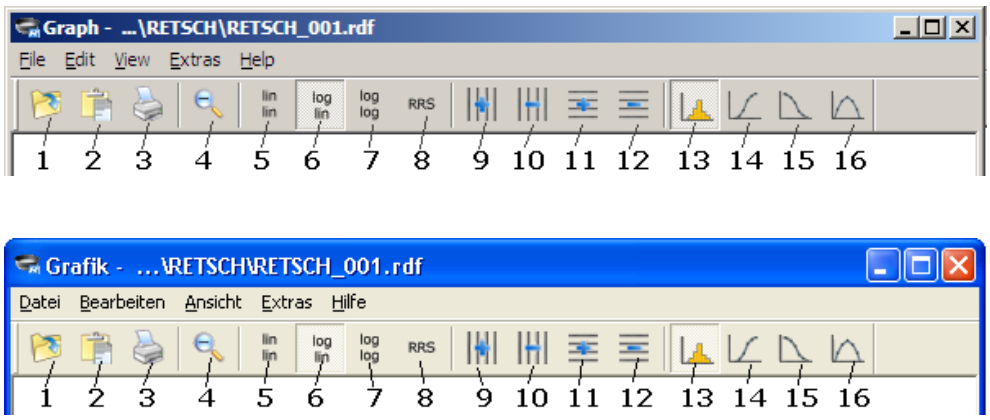


Fig. 35: Buttons in the toolbar in the graph window

No. of the	Menu item or function

button	
1	"File"-"Comparison File"
2	"Edit"-"Copy"
3	"File"-"Print"
4	Increase the x axis display (in accordance with measuring range)
5	Representation of the y axis linear, x axis linear
6	Representation of the y axis linear, x axis logarithmic
7	Representation of the y axis logarithmic, x axis logarithmic
8	Representation of the cumulative distribution in the RRSB grid
9	Add vertical grid lines
10	Delete vertical grid lines.
11	Add horizontal grid lines
12	Delete horizontal grid lines
13	Mapping onto left y axis = bar chart p3
14	Mapping onto left y axis = cumulative distribution curve Q3
15	Mapping onto left y axis = cumulative residue curve 1-Q3
16	Mapping onto left y axis = density curve q3

Note: The right y axis continues to be used for mapping the Q3 cumulative distribution.

7.1 File - Menu Commands

File – Menu Commands

The file menu contains the following commands:

Read comparison file Allows several sievings to be compared in a graph

Print graph The displayed graph is printed

Exit The graph window closes



Fig. 36: Menu Commands File

7.1.1 Read Comparison File

One or more comparison curves (maximum of 9) showing the most recently executed or loaded sievings can be loaded (if necessary with the help of the Shift or Ctrl keys).

These are displayed as well in the presentation afterwards until the graph window is closed or until deleted by clicking with the right mouse button on the file names in the legend.

The sieving tasks in the comparison files can be very different from the original file and from each other. Each selected raw data file is evaluated with the current status of parameters for the sieving task under which it was measured (the name of the sieving task is contained in the *.rdf file).

7.1.2 Print Graph

The measurement graph produced on the screen is printed out. The file name of the measurement is placed in front of this in the printed image.

The font and font size for the graph designation is decided by the setting in the “Extras” menu item.**Fehler! Textmarke nicht definiert.**

7.1.3 End

The graph window is closed. Whenever the graph window is called up again, the comparison files must be reloaded. If changes made to the graph setting are to be effective in the representation of subsequent measurements also, the sieving task must be saved again (see “Sieve analysis” - save sieving task”).

7.2 Edit - Menu Commands

Edit – Menu Commands The Edit menu contains the following command:

Copy Copies the graph into the clipboard

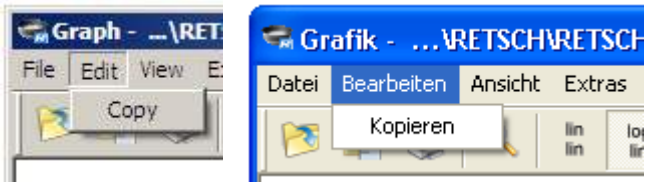


Fig. 37: Edit Menu

7.2.1 Copy

The graph presented on the screen is copied in Metafile format into the clipboard. The file name of the measurement is pasted to identify the measurement. In the case of mean values the table is marked as a mean value table.

7.3 View - Menu Commands

View – Menu Commands

The View menu contains the following commands:

Characteristics Opens the selection window for the characteristics that are to be displayed

Units Allows the measuring units to be selected

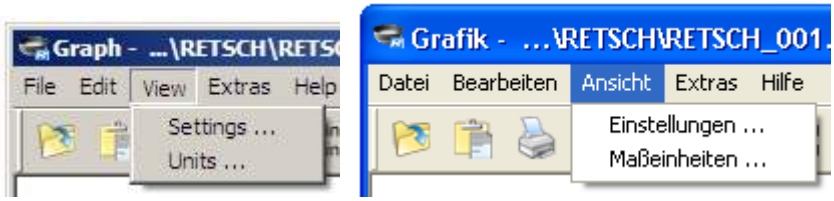


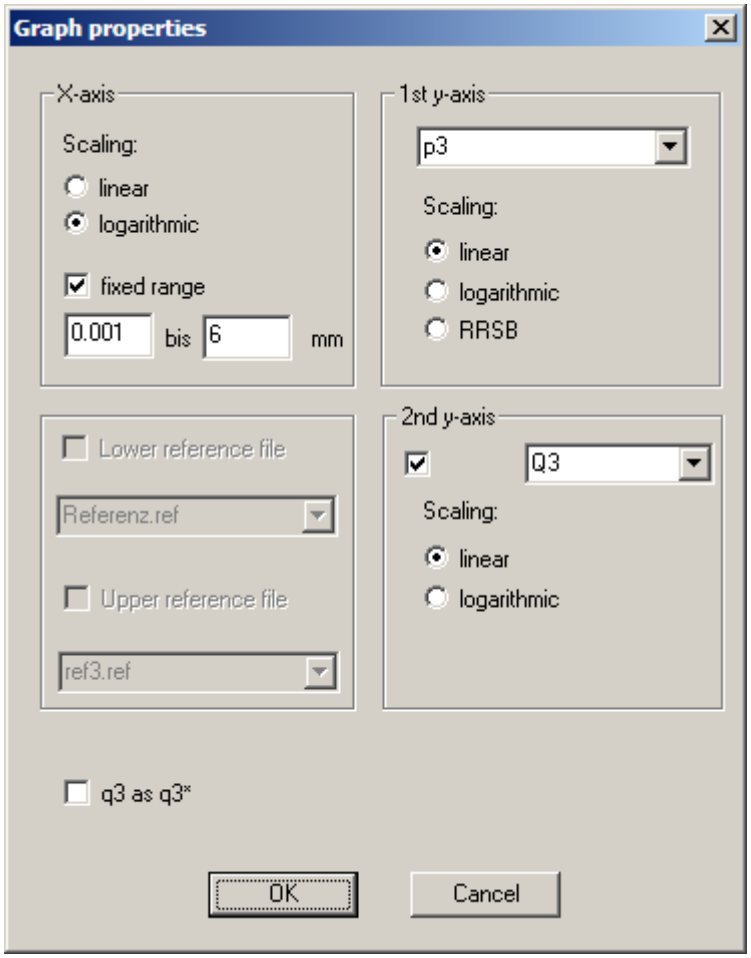
Fig. 38: Edit Menu

7.3.1 Settings

Essential graph settings may be made here. In particular it is possible to configure the right y axis (= 2nd y axis) and map it to curve and bar types.

The axes in the graph can be configured as linear or logarithmic. The choice of the “RRSB” for the first y axis blocks the second y axis. It is not possible to combine a linear x axis and a logarithmic y axis. In addition a fixed range in mm can be specified for the x axis also.

Reference curves *.ref can appear as cumulative distribution or residue curves under the “upper limit” and “lower limit” designations. These settings are effective if Q3 and 1-Q3 are presented for the y axis.



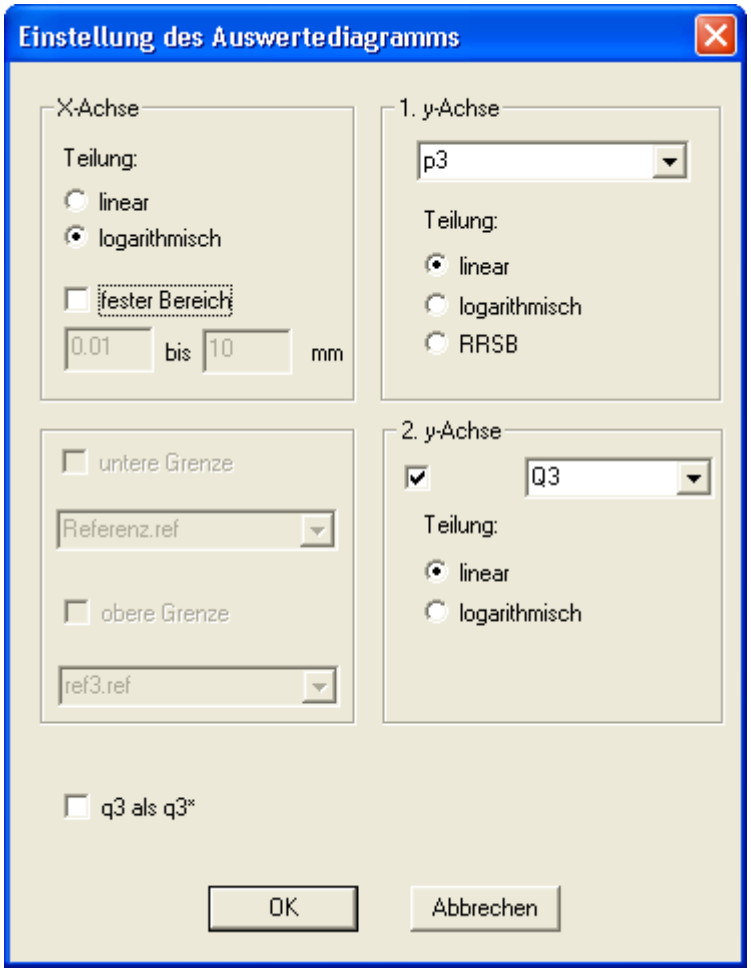


Fig. 39: Graph settings

7.3.2 Measuring Units

Measuring Units

This menu item summarises the settings for the measuring units in the graph window. You can choose between having the grain size presented in µm or mm. The totals and fractions are presented optionally normalised to 1 or in %.

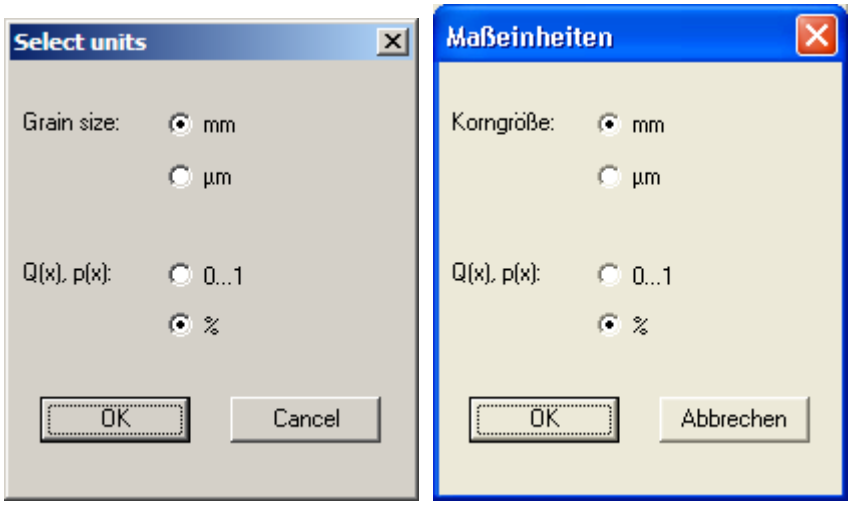


Fig. 40: Measuring Units Settings for the Graph Window

7.4 Extras – Menu Commands

Extras – Menu Commands

The Extras menu contains the following commands:

Colours	Selection of the colours for the individual curves
Type of curves	Selection of the type of curve
Type of bars	Selection of the type of bar for the p3 presentation
Grid	Definition of the grid presentation
Legend	Selection of the legend properties

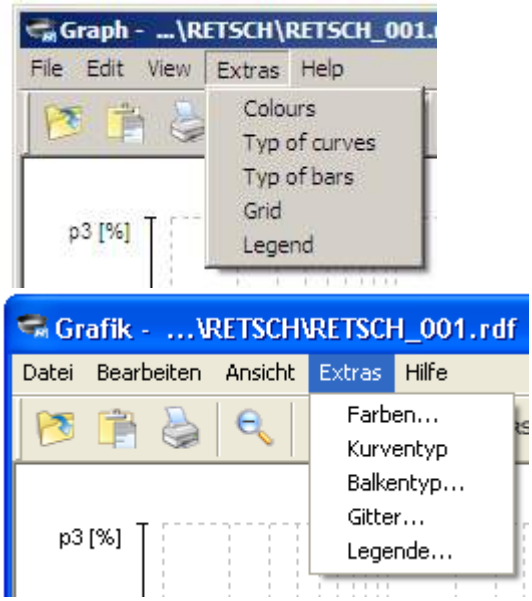
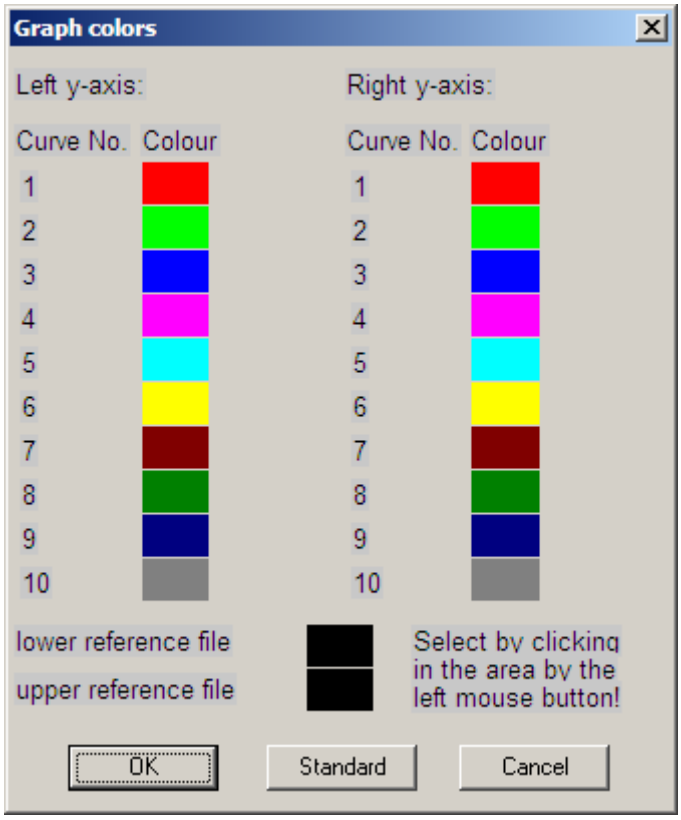


Fig. 41: Commands in the Extras Menu

7.4.1 Colours

The “Graph colour settings” dialogue allows colours to be assigned at will to each curve.



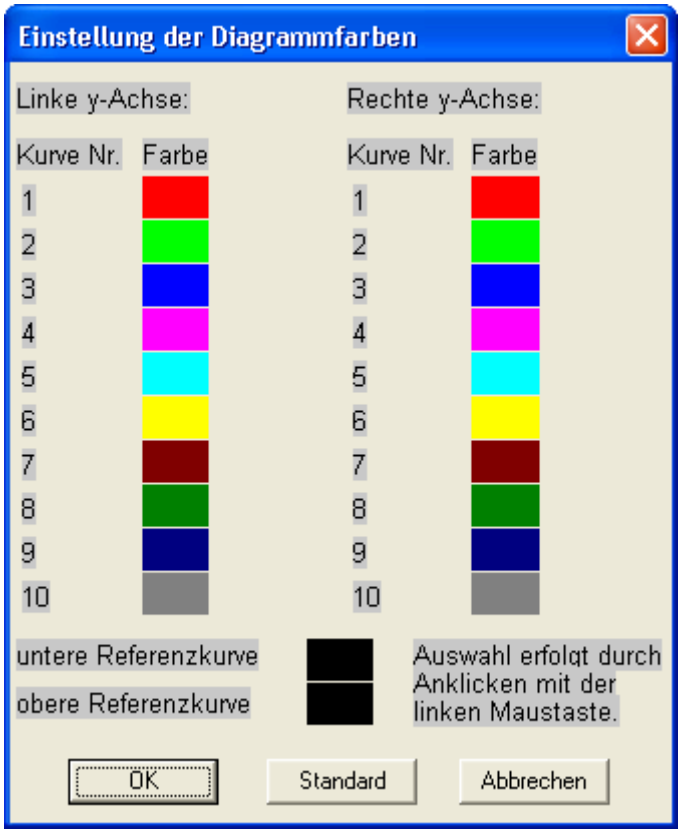


Fig. 42: Diagram Colour Settings

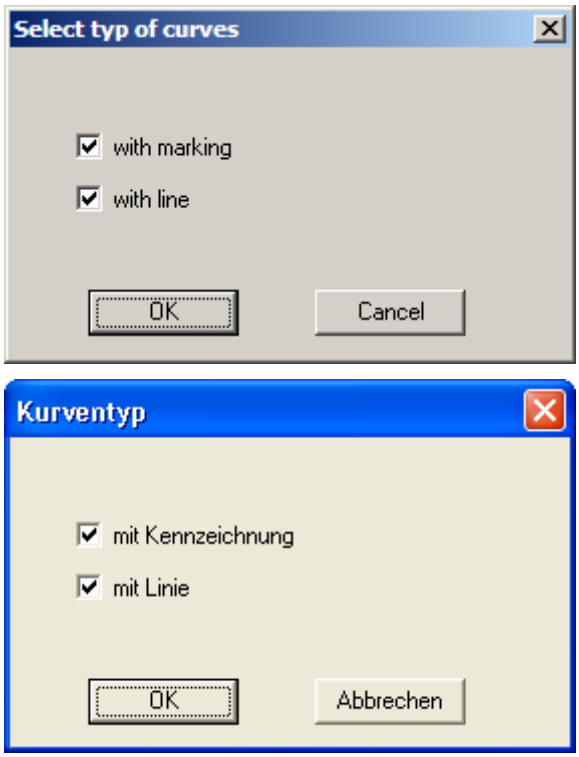
An individual colour can be chosen for each axis in the curve or bar presentation by left-clicking on the respective colour field. The reference curves can be

assigned their own colours too. A quick change is possible then through the Windows colour selection dialogue.

The “Standard” key allows a quick resetting of the curve colours at any time to the program’s standard colours.

7.4.2 Curve Colours

Whether or not the curves that are presented should have lines and/or symbols (marking sieve fractions) is controlled here. At least one option must be selected.



7.4.3 Type of Bar

The “Select Type of Bar” dialogue allows the configuration of the bar representing the fraction shares. When the “frame” type of bar is chosen, the bar is shown in the colour of the selected curve colour and otherwise as the bar structure in the corresponding curve colour surrounded by a black frame.

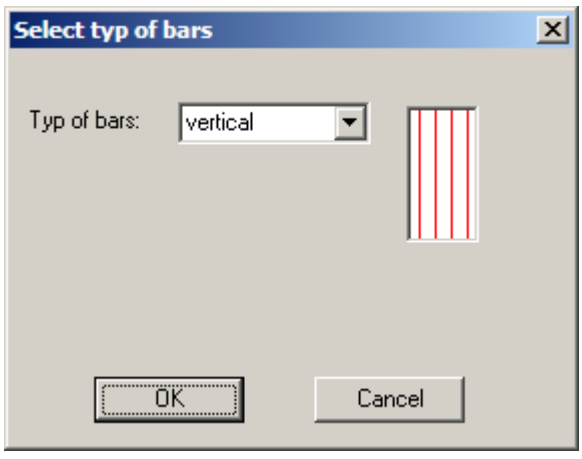
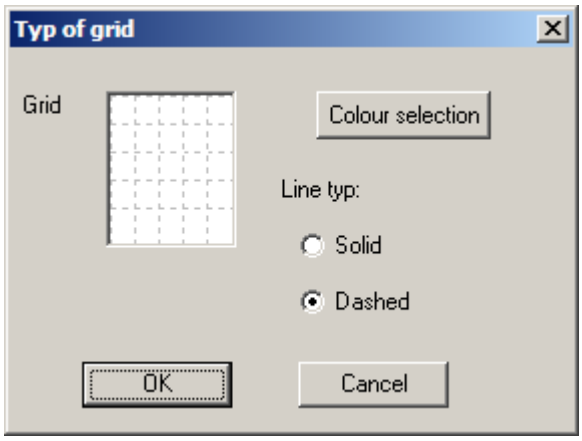




Fig. 43: Type of Bar Setting

7.4.4 Grid

The grids in the graph can be configured with respect to type of line and colour. The grid colour can be changed quickly by clicking on Colour Selection in the Windows colour selection dialogue.



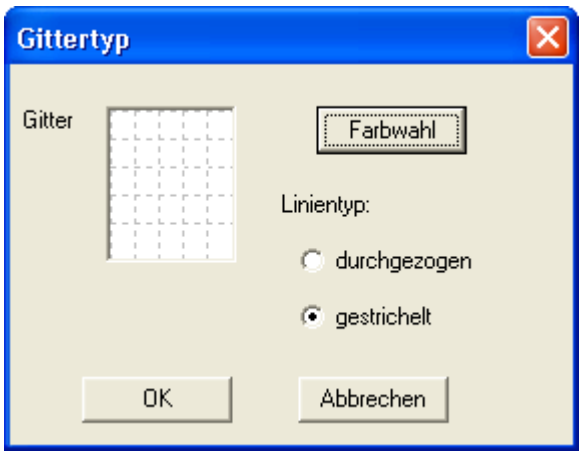


Fig. 44: Type of Grid Setting

7.4.5 Legend

The legend can be configured here. This appears in the diagram only when the “Description of Curves” was activated.

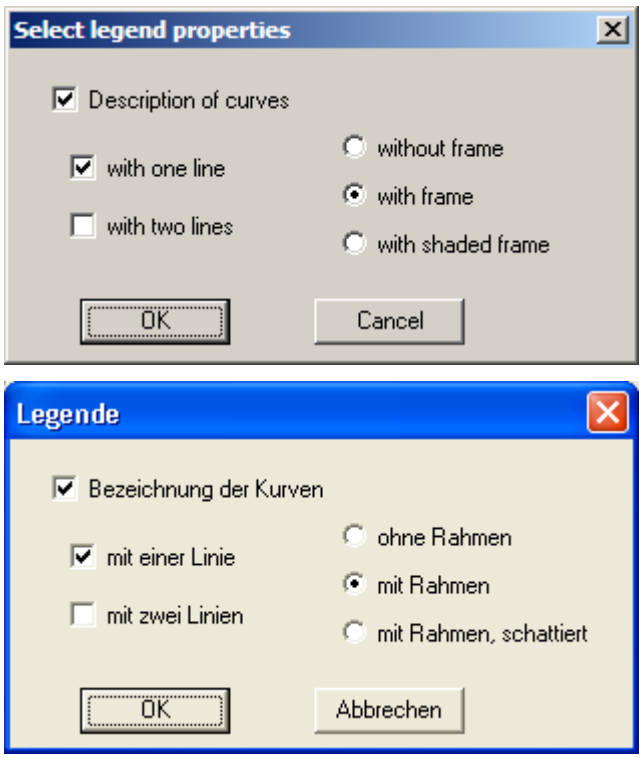
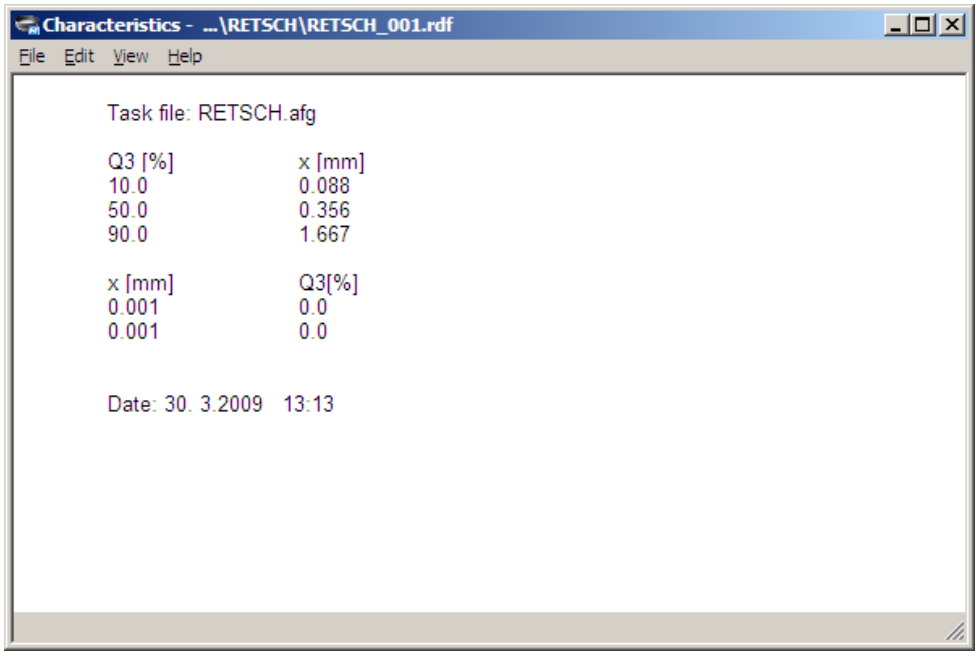


Fig. 45: Legend configuration

The selection “with two lines” is effective only if the right y axis is activated in the graph.

8 Characteristics Window - Description of the Menu Options

The characteristics window is used to display the characteristics in the current sieving.



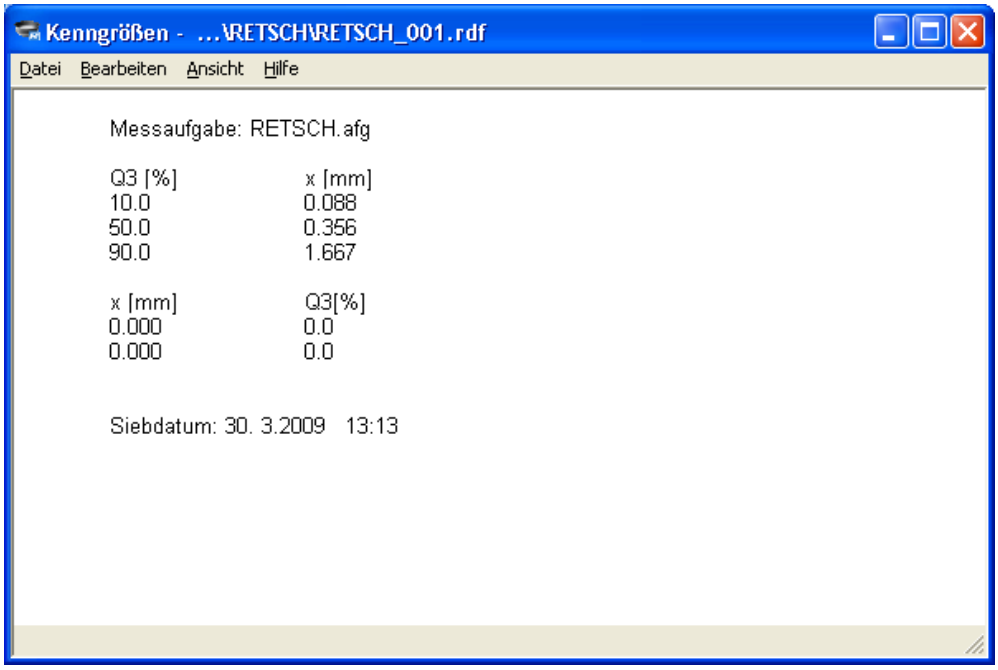


Fig. 46: Characteristics Window

8.1 File - Menu Commands

The menu file contains the following commands:

Print characteristics Prints the currently displayed characteristics table

Exit Closes the characteristics window

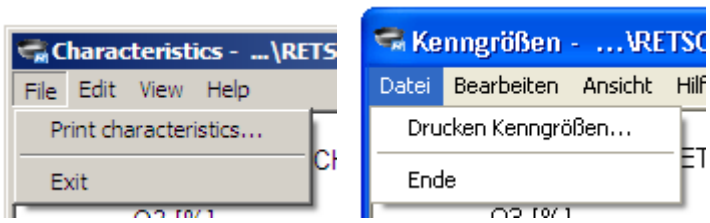


Fig. 47: Characteristics - Menu File

8.1.1 Print Characteristics

The characteristics table produced on the screen is printed. In the print image the name of the sieving file is placed in front of the table.

The font and font size of the printed characteristics table is determined by the settings in the “Extras” “Screen Font” menu item.

If any alterations made to the selection of characteristics are to be effective for subsequent sievings as well when the characteristics window is closed, the sieving task must be saved again now (see “Sieve Analysis” - “Save Sieving Task”).

8.1.2 End

Exit

The characteristics windows is closed.

8.2 Edit - Menu Commands

Edit – Menu Commands

The Edit menu contains the following commands:

Copy	Copies the displayed table window into the clipboard
Copy (ASCII)	Copies table contents as ASCII text into the clipboard
Show characteristics	Displays characteristics
Show measurement conditions	Displays the measurement conditions on which the sievings are based

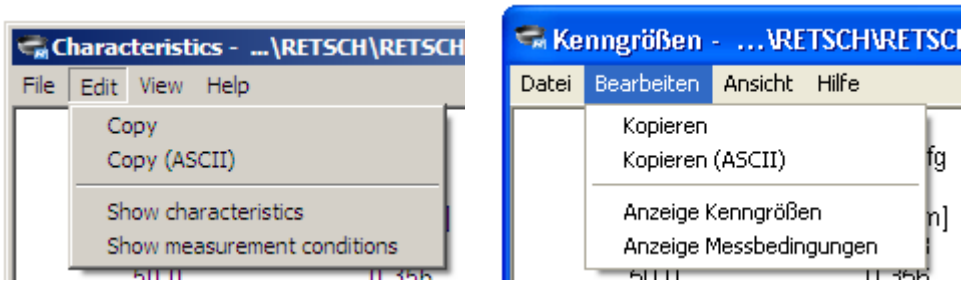


Fig. 48: Edit Menu

8.2.1 Copy

The characteristics window shown on the screen is copied in Metafile format into the clipboard. To identify the sieving, the file name of the sieving is inserted. The mean values are marked as such.

8.2.2 Copy (ASCII)

The individual characteristics are copied in ASCII format into the clipboard. A line consists of the description of the characteristics and the value of the characteristic. The elements in a line are separated by tabulators. As a heading the descriptions “characteristic” and “value are placed in front of the table. Numerical values are shown with a “comma”.

8.2.3 Show Characteristics

Once this menu item is called up, all data noted in the report header for a sieving are shown in the characteristics window.

- Name of the sieving task
- The characteristic and the associated value. The characteristics that are to be shown can be selected in the “View Characteristics“ menu item.
- Date and time of the sieving

8.2.4 Show Measurement Conditions

Once this menu item is called up, all data marked in the report title for a sieving are shown in the Characteristics window.

8.3 View - Menu Commands

View – Menu Commands the View menu contains the following commands:

Settings	Opens the selection window for the characteristics to be displayed.
Measuring Units	Enables the selection of units

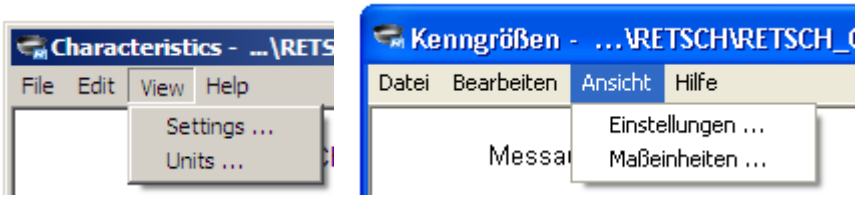


Fig. 49: Menu View

8.3.1 Settings

This is where the individual characteristics are selected and set.

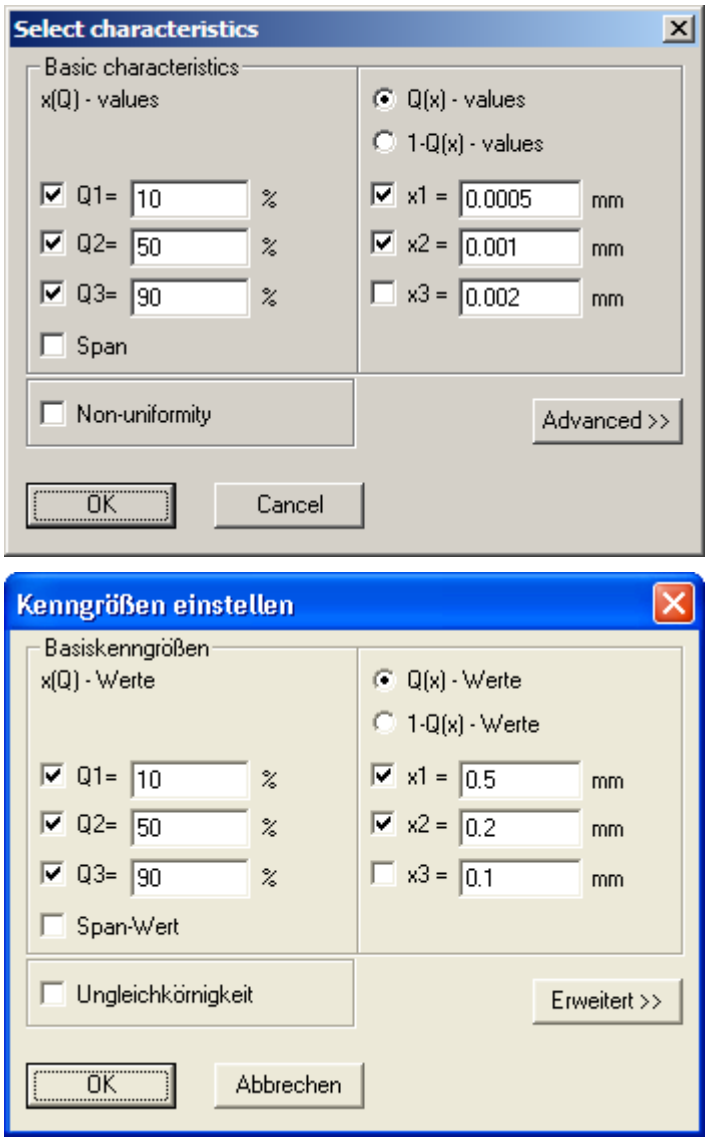
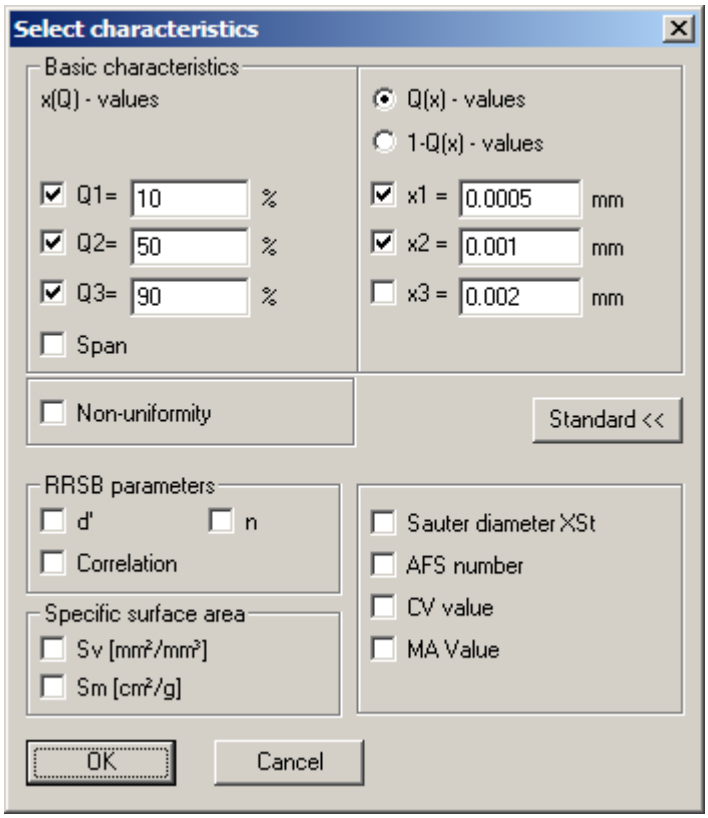


Fig. 50: Selection and Setting of the Individual Characteristics

The following can be selected:

- 3 adjustable x (Q3) - values, the % value is freely selectable
- Span value = (x (Q3) - x (Q1))/x (Q2)
- Non-uniformity = x (60) /x (10)
- 3 adjustable Q3 (x) or alternatively 3 adjustable 1-Q3 (x) values

Under the advanced settings (“Advanced” key) some additional special characteristics can be selected for presentation.



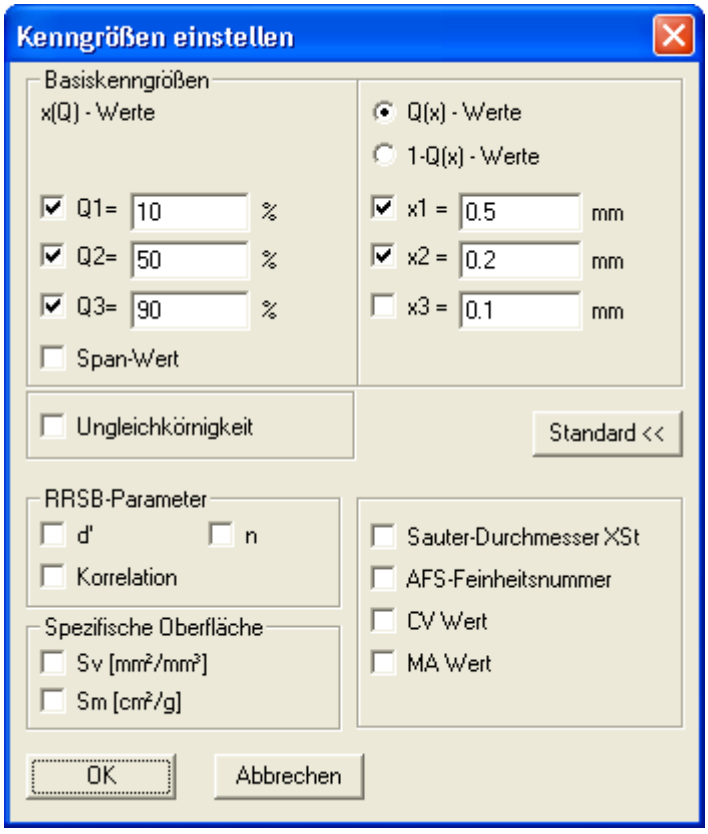


Fig. 51: Select Special Characteristics for Presentation

The following can be selected:

- the values characterising a possible RRSB distribution d', n and correlation (correlation = correlation of the RRSB lines found with the measured distribution). The RRSB characteristics are calculable only if the Q3 values of at least 2 sieve fractions lie between 5% and 95%.
- Specific surface Sv [mm^2/mm^3]
- Specific surface sm [mm^2/g]. If no material density was defined for the sieving task, the selection of this characteristic is disabled.
- Sauter diameter xSt = 6/Sv
- AFS grain fineness number: (Only calculable if the appropriate sieves were used.) The selected sieves must be a subset of the AFS series of sieves 0.020 mm, 0.063 mm, 0.090 mm, 0.125 mm, 0.180 mm, 0.250 mm, 0.355 mm, 0.500 mm, 0.710 mm, 1 mm, 1.4 mm, 2 mm, 2.8 mm, 4 mm, 5.6 mm. Furthermore, all AFS sieves must be included between the smallest and the largest sieve.
- CV value Coefficient of variation

  Standard deviation of the particle size distribution divided by the median; (dimensionless)

$$CV = 50\,\frac{x_{84} - x_{16}}{x_{50}} \quad \text{with} \quad x_{84} = x(Q_3 = 84\%);\ x_{16} = x(Q_3 = 16\%);\ x_{50} = x(Q_3 = 50\%)$$

- MA value Mean Aperture = D50 value = median diameter x50

The calculation of the specific surfaces Sm and Sv is always based on a sphere model.

8.3.2 Measuring Units

The menu item summarises the settings of the measuring units in the characteristics window. You can choose between presenting the grain size in µm or mm. The totals and fractions are shown normalised to 1 or in % as desired.



Fig. 52: Measurement Units in the Characteristics Window

9 Mean - Description of the Menu Items

This command serves to form the mean value of several sievings saved under one sieving task. A precondition for the formation of the mean is the use of the same sieve stacks in all the sievings used as the basis for forming the mean.

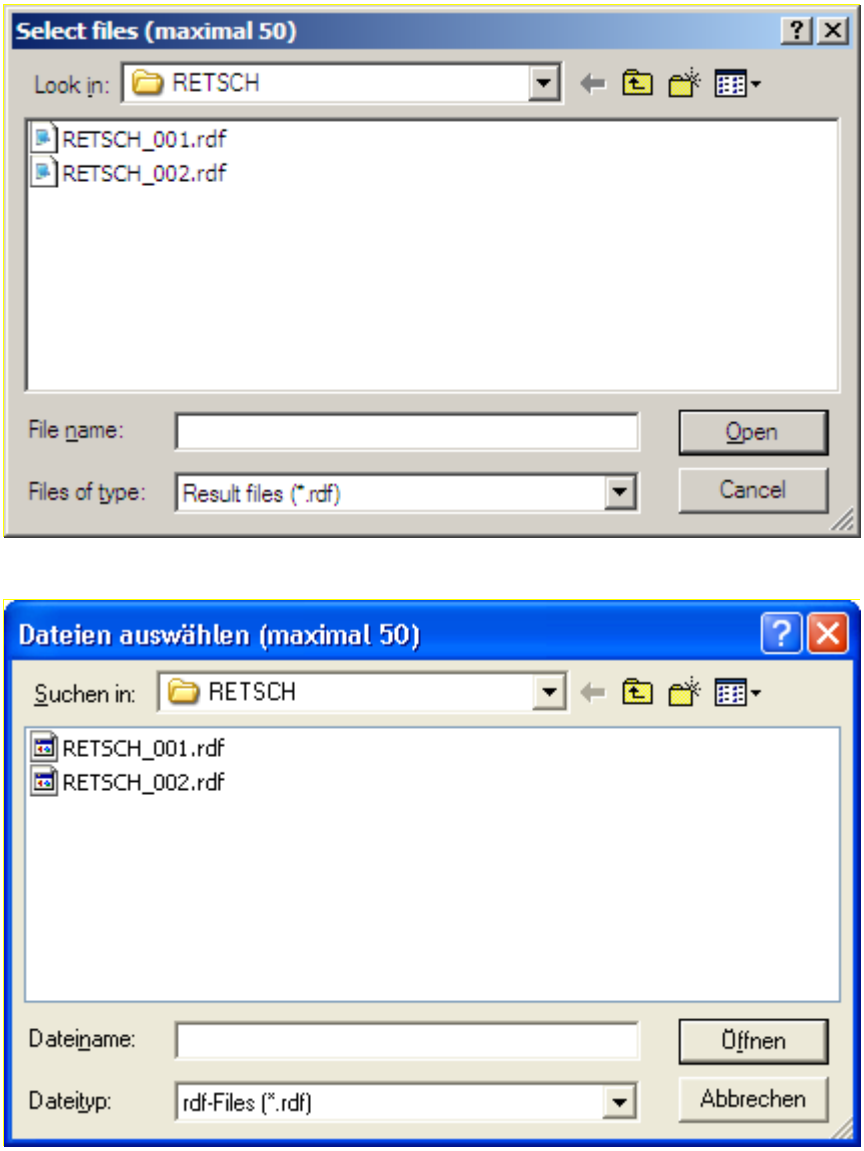


Fig. 53: Command for the Formation of the Mean

A mean can be formed from up to 50 sievings. The files which can be used as the basis to form a mean must be highlighted in the “Select Files” box (if necessary with the aid of the Shift or Ctrl keys).

Providing there is no error in the selection of files, the averaging result will be displayed as soon as “Open” is clicked.

The averaging result is then available as a current sieving in RAM and can be saved by means of “Save file” (rdf file) or file export (xld, xle and/or ccg file).

10 Trend Analysis Window - Description of the Menu Items

The trend analysis permits the representation of the temporal course of selected characteristics in a measuring series. The x50 characteristic is shown as standard.

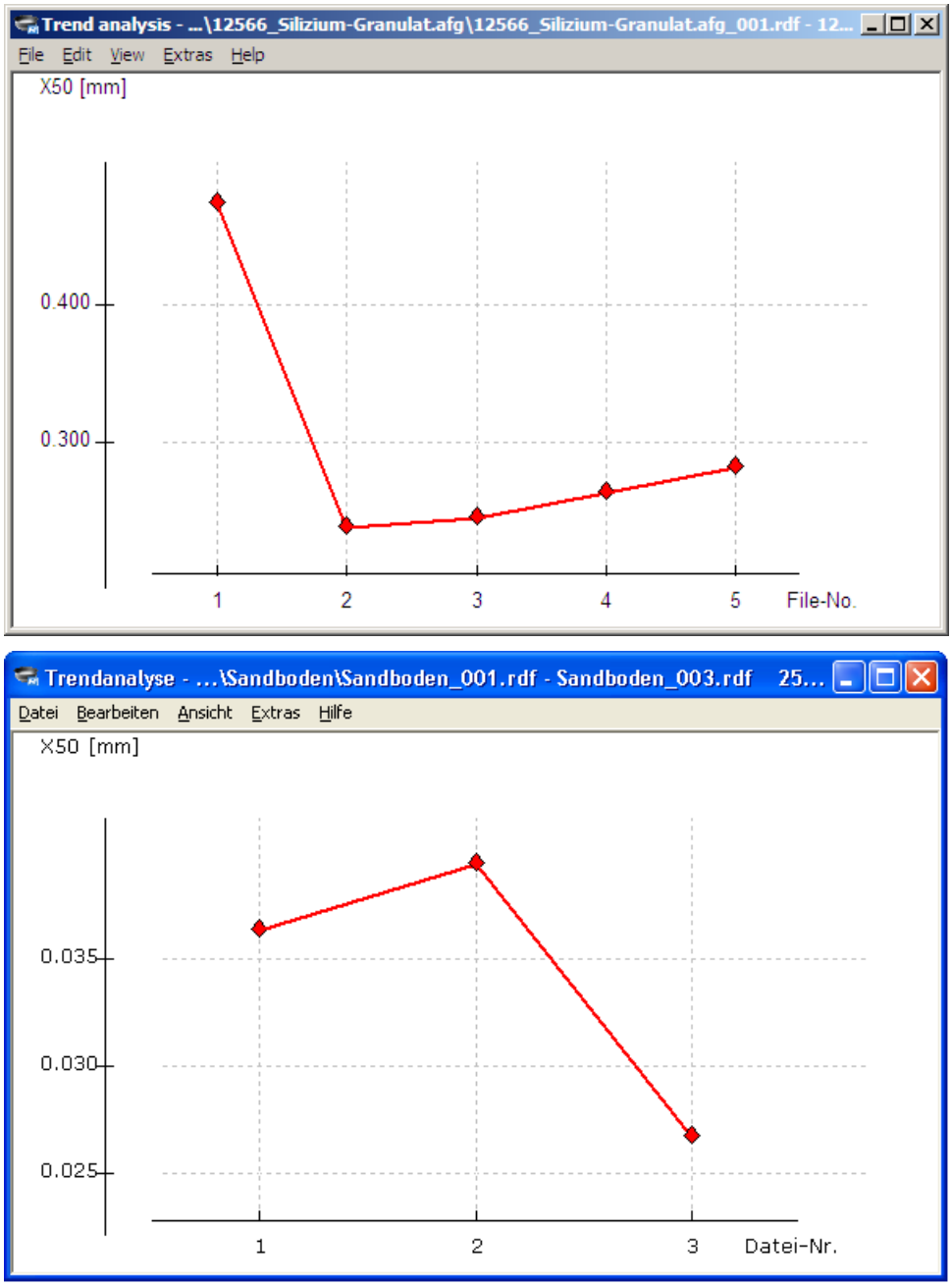


Fig. 54: Representation of the Time Course of Selected Characteristics

A series of measurements for conducting the trend analysis is composed of a number of files created using the same sieving task and filed in the same directory.

When the trend analysis is called up, the user is asked to select the series of measurements.

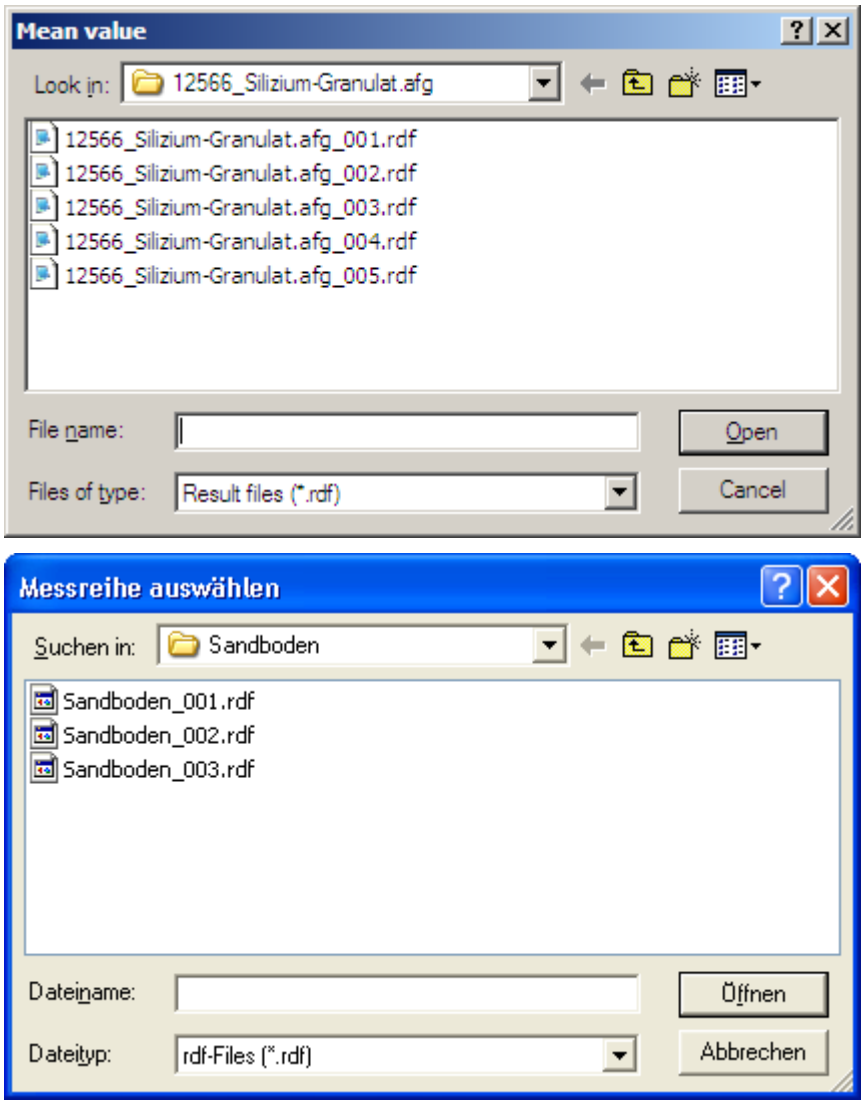


Fig. 55: Selection of the Series of Measurements

It is sufficient here to click on a raw data file that belongs to a series of measurements. Once the selection has been confirmed, the measuring series that belongs to this file is prompted in a dialogue box.

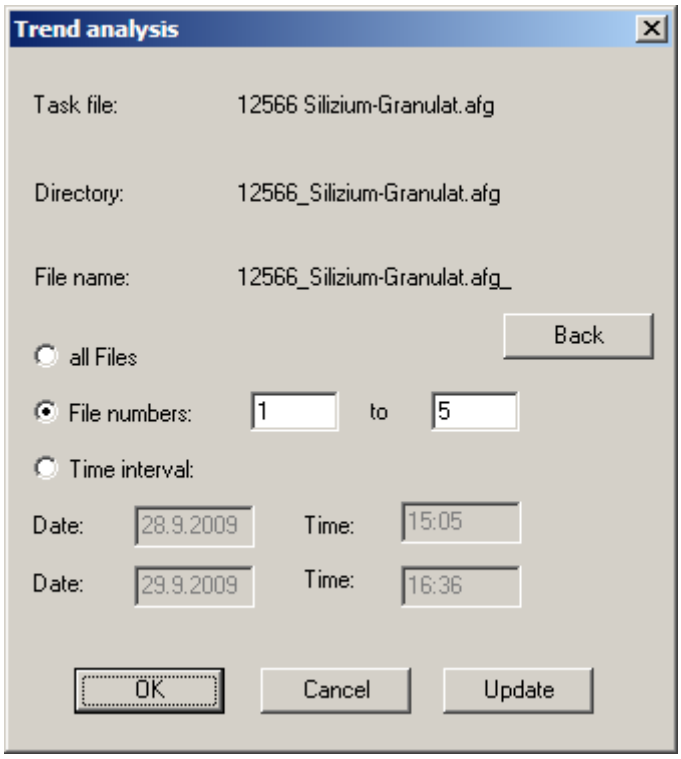




Fig. 56: Selection of the series of measurements

The selection is determined by the setting decided in the corresponding sieving task.

In the dialogue the selection of files can be specified further.

All files:
All files are analysed without taking the file name into consideration. They are presented on a time axis.

File numbers:
All files with the selected file name (e.g. “M”) are displayed, whereby the range of numbers is adjustable. They are represented on a “file no.” axis.

Time range:
All files with the selected file name (e.g. “M”) are shown, whereby a restriction in time range is possible. They are presented on a time axis.

If the setting is changed, the updated file and time range can be shown when the “Update” button is pressed.

Once the file selection is confirmed by clicking on “OK”, the adjusted characteristics are shown in their time course. The x axis is determined by means of the selected file numbers or time range.

10.1 File - Menu Commands

The file menu contains the following commands:

Print trend analysis Prints the displayed graph

Exit Closes the trend analysis window

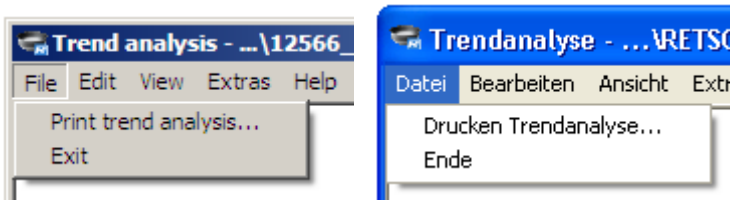


Fig. 57: Menu File Trend Analysis

10.1.1 Print Trend Analysis

The adjusted trend graph is printed. As identification the trend window header is placed in front of the printed graph.

10.1.2 End

The trend analysis is ended. If any changes made in the trend analysis setting are to be effective in subsequent analyses also, the sieving task must be saved again (see “Sieve analysis” - “Save sieving task”).

10.2 Edit - Menu Commands

Edit Menu Commands

The Edit Menu contains the following command:

Copy Copies the displayed graph into the clipboard

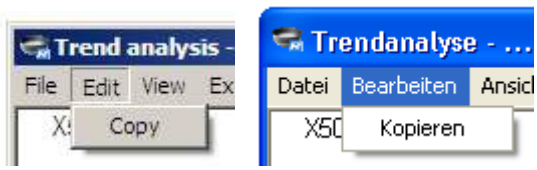


Fig. 58: The displayed graph is copied into the clipboard

10.2.1 Copy

The adjusted trend graph is copied into the clipboard. The headline of the trend window is inserted into the graph as identification.

10.3 View - Menu Commands

The View menu contains the following commands:

Characteristics Setup of characteristics and graph parameters

Units Selection of the measuring units for the graph



Fig. 59: View Menu – Characteristics

10.3.1 Settings

This menu item exists only in the task mode. Here the quantity can be set and the characteristics to be shown over the course of time can be selected.

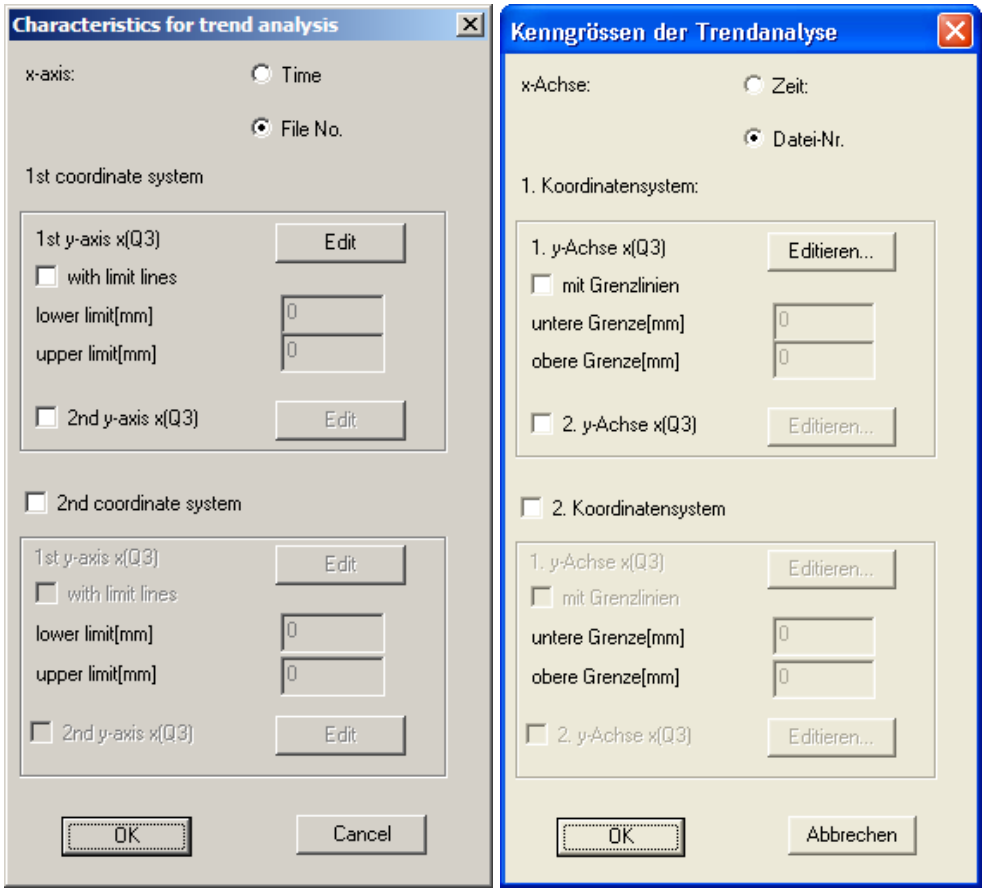


Fig. 60: Quantity Setting and Selection of the Characteristics to be Represented in their Time Course

X axis:

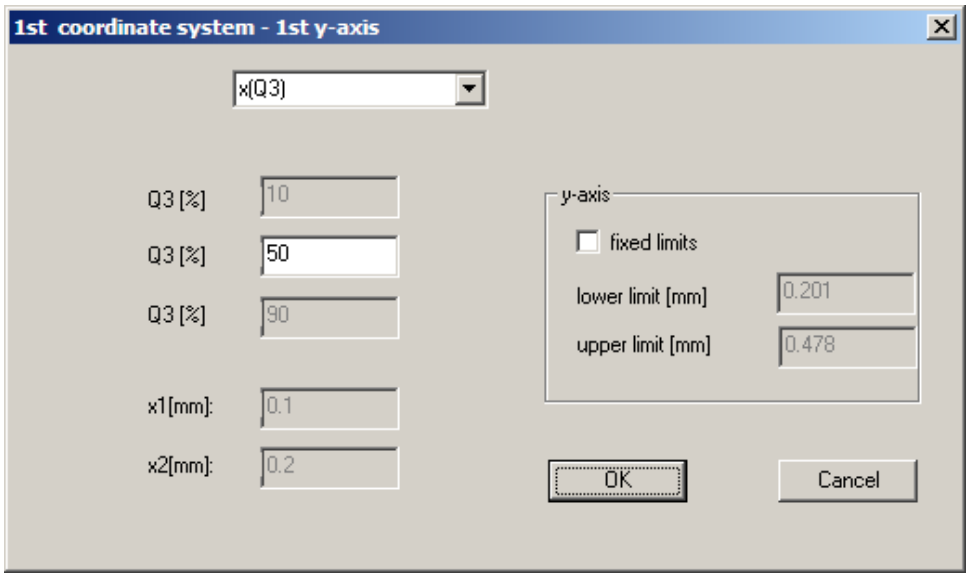
The x axis is configured in the graph as a time axis. Presentation is possible in minutes, hours and days. These variables are set in “View” “Units”

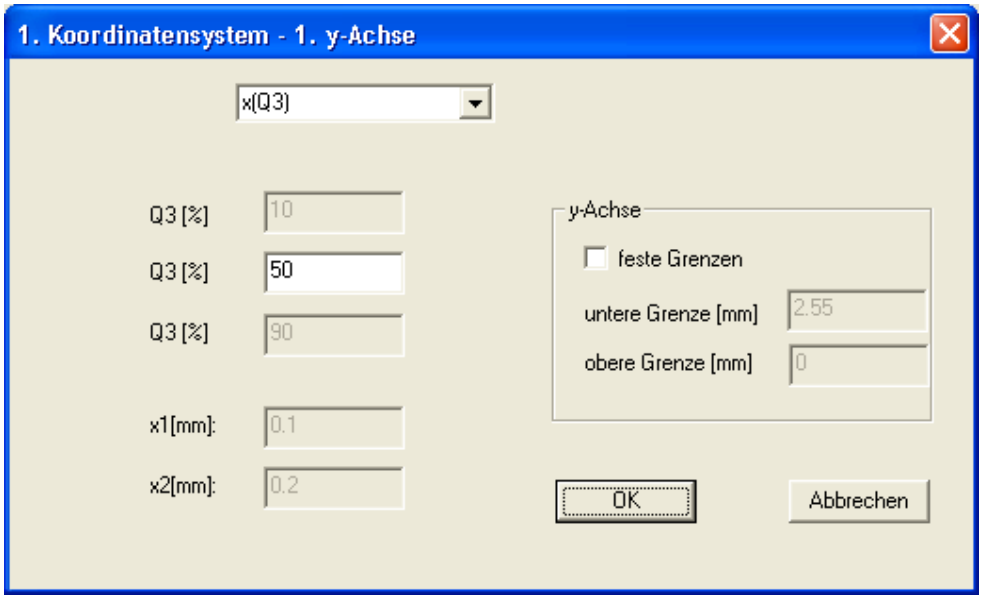
File no.

The x axis is configured in accordance with the number of files to be analysed.

Y axis:

One to four characteristics can be shown in one or two coordinate systems. Up to two characteristics can be shown in each coordinate system. Each characteristic can be configured with the aid of the “Edit” button.





The characteristics which can be represented are

x (Q3)	Only one Q3 measurement need to be entered for this.
Q3 (x)	One x value must be entered here.
1-Q3 (x)	One x value must be entered here
p3 (x1, x2)	Two x values x1, x2 must be entered for this.
Span value	Three Q3 values have to be entered here.
Non-uniformity	It is not possible to edit this parameter.

If required, fixed limits can be entered for the y axis (“upper limit” and “lower limit”).Otherwise the limits are set automatically according to the range of fluctuations in the measurements.

With limit lines:

In each trend graph limit lines can be defined as required for the left y axis, which make it clear to the user when measurements exceed certain limits or fall short of them. The y-values for the limit lines can be entered then as upper and lower limits.

The first coordinate system is always active. If the 2nd coordinate system option is selected, 2 graphs are shown underneath each other in the trend graph window. The parameters for the second coordinate system can be selected in the same way as for the first coordinate system.

10.3.2 Measuring Units

The measurement units to represent the trend analysis can be set here.

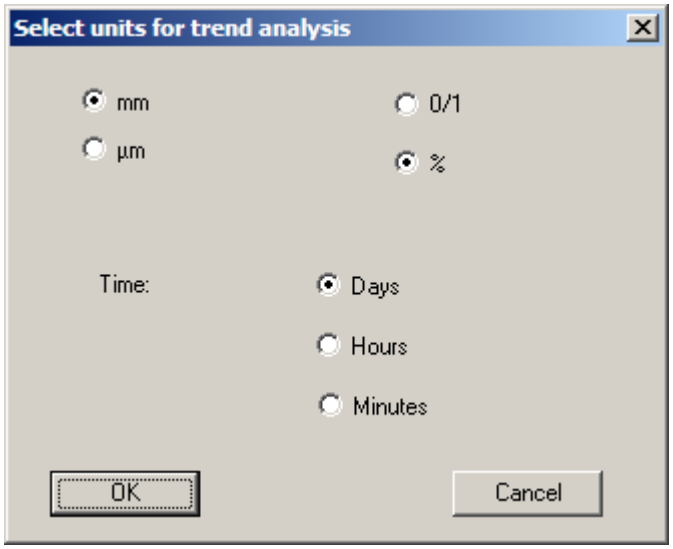




Fig. 61: Units for presenting the trend analysis

The selection of days/hours/minutes is effective only if the x axis was configured as “time”.

10.4 Extras – Menu Commands

The Extras menu contains the following command:

Curve colours Settings for the colours to be used for displaying the curves



Fig. 62: Colour Settings for the Curves

10.4.1 Curve Colours

The colours for the curves in the trend analysis can be set here.

The curve colours can be changed by left-clicking on the colour shown. The colour can then be changed quickly with the aid of the Windows colour selection dialogue.



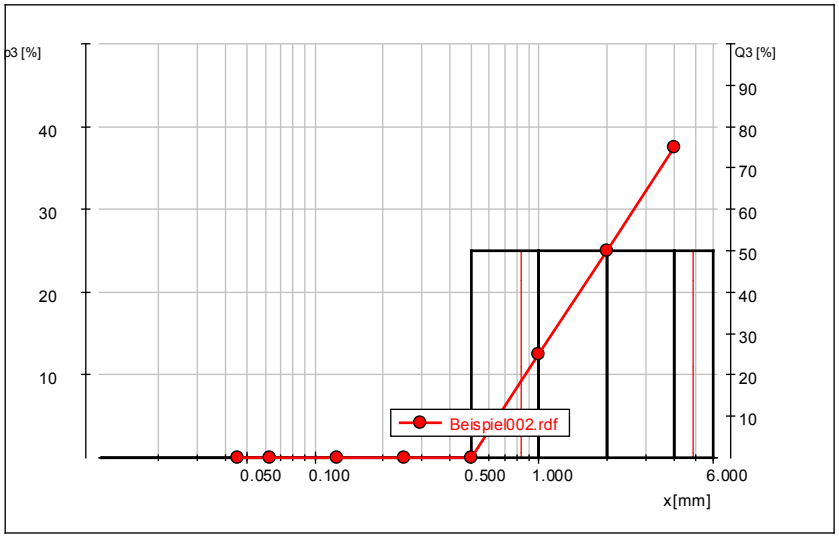
11 Appendices and Examples

11.1 Print Report

EasySieve®

Firma:			
Bearbeiter:			
Ergebnisdatei:	C:\Projekte\SiebProg\SIEVEDAT\Sieb0\Beispiel002.rdf		
Siebaufgabe:	sieb0.afg		
Siebdatum:	14.12.2001 14:24	Siebdauer [min]:	5
Siebmaschine:		Amplitudenwert [mm]:	1.5
Intervallbetrieb		Intervallzeit [s]:	15.0
Manuelle Gewichtseingabe			
Material:			
Siebgutmenge [g]:	4.00	Rückwaage [g]:	4.00
Siebverlust [%]:	0.00		
Probenahme:		Probenvorbereitung:	
Siebverfahren:		Siebgröße:	
Siebnorm:		Siebhilfen:	
Kommentar:			

Kornklasse [mm]	p3 [%]	Q3 [%]
< 0.045	0.0	0.0
0.045 - 0.063	0.0	0.0
0.063 - 0.125	0.0	0.0
0.125 - 0.250	0.0	0.0
0.250 - 0.500	0.0	0.0
0.500 - 1.000	25.0	25.0
1.000 - 2.000	25.0	50.0
2.000 - 4.000	25.0	75.0
> 4.000	25.0	100.0



Kenngrößen:

Q3 [%]	x [mm]
10.0	0.700
50.0	2.000
90.0	5.200

Bearbeiter:

Analysenbericht nach DIN 66165
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