Operation Instruction Rhesy S for Rheomat 180

1 Introduction

Rhesy S is a Software for reading rheological Measurement data of the viscometer Rheomat 180, 225 and 325. It allows to put out these data as ASCII or EXCEL data, to store and to evaluate in this Software. Different classical models of evaluation are available.

In addition this software allows defining and storing of measurement procedures. This way routine measurement can be easily repeated.

For comparing measurements it is possible to define one set of measurement data as master. Further measurements can be compared to this master.

With one PC several Rheomat can be controlled. The number of controlled instrument is depending on the number of serial ports only.

1.1 Hardware-Requirements (minimum)

Hardwarerequirements for PC are as follows:

IBM-PC or compatible PC, at least Pentium 166 MHz
64 MB Memory (RAM)
CD-ROM driver
1 free serial or USB port
Windows 95 / 98 / ME / NT 4.0 / 2000 / XP
Mouse

Make sure that the operating systems has been duly updated

Working with serial port: Find out at which COM- Port you will connect the Rheomat R 180. This information has to be entered into the software.

Working with USB port: Connect to the USB port a cable USB to serial port. You can order the corresponding cable with no. 401-0920. First install this cable according to its instruction. Find out which COM port corresponds to you USB port.

Tip: The software Rhesy S is delivered with serial cable. Communication between PC and viscometer R 180 is only possible with this original cable. If the R 180 is operated by USB port this cable must be used in addition to the „USB- to-serial- Cable“.

1.2 Transmission rate

Enter the desired transmission rate to your rheomat R 180. (2400, 4800, 9600) Therefore press the “automatic”- key while switching the instrument on. Enter Code 33. Enter Baudrate: for example 9600.

The software works as well with the previous models RM 180 from Mettler Toledo or Rhemetric Scientific. These instruments have a predefined transmission rate of 2400 baud.

1.3 Installation of Software Rhesy S

Put the CD into the disc drive. The program will be installed automatically. You can start installation as well by double click on setup.exe.

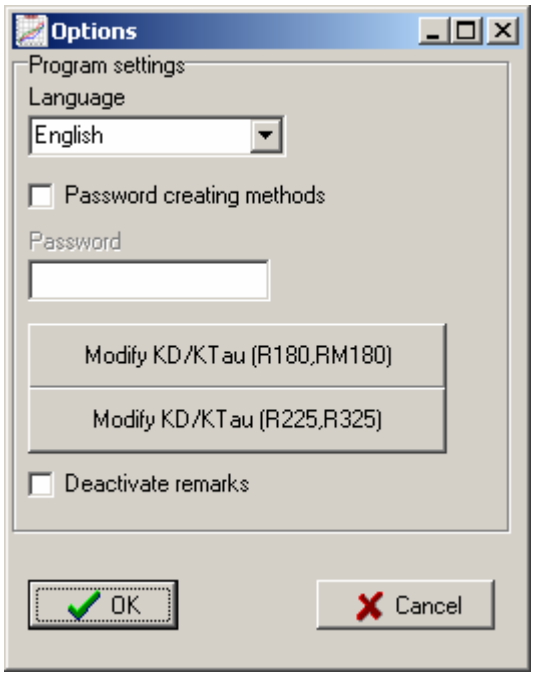
Start Rhesy S by selection on Start / Program / proRheo.

You will see the following window:

1.4 Options

1.4.1 Program Settings

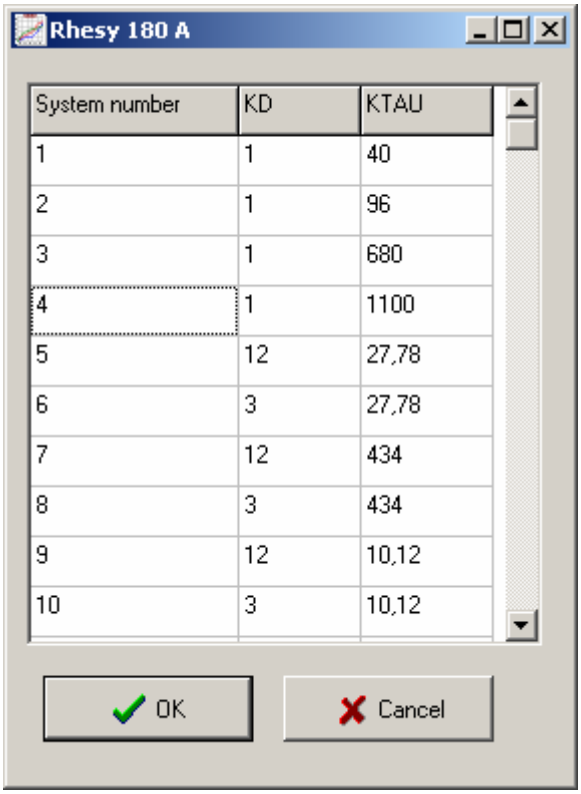
Different parameters have to be chosen here:



Language: Choose the language you like**.** Additional languages can be entered (see chapter tips and tricks)

Password for Measurement procedures: A password can be set up to guard the sections „Edit Program“ and „Options“. Thus the program can be operated by assistants who should not change the measurement procedures.

Editing measuring systems: For calculation of shear stress, shear rate and viscosity the parameters of the measuring system in use are needed. The standard measuring systems of the Rheomat R 180 are already defined. If self defined measuring systems are used the system parameters have to be entered into this table as well as in the R 180.



The predefined measuring systems of the R 180 can be printed out by pressing the „Print“-key and simultaneously switching on the instrument. (A printer must be connected to the printer port of the R 180!)

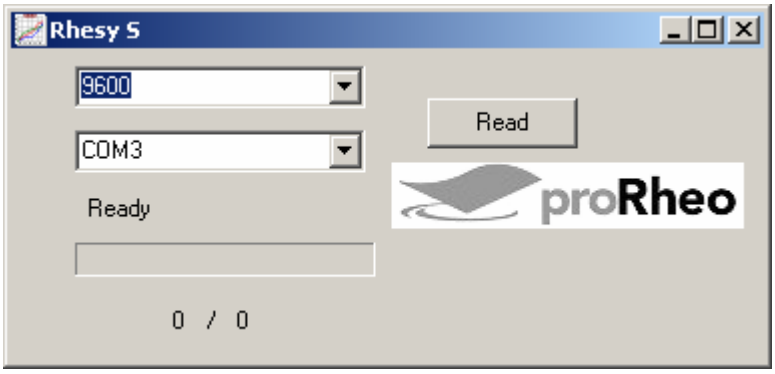
2 Read Data

For reading data from the R 180 or RM 180 at least one automatic measurement must have been proceeded and stored. These measurement data will be put out on the serial port of the viscometer as soon as the “Computer”-key is pressed.

Proceeding:

- Connect the R 180 to the PC as described in Chapter 1
- Assure that measurement data had been stored. (At least one measurement in automatic mode was done).
- Switch on the R 180.
- Start Software.
- Press “Computer“-key of R 180.
- Data will be read.

Data transmission is displayed in the lower part of the window.

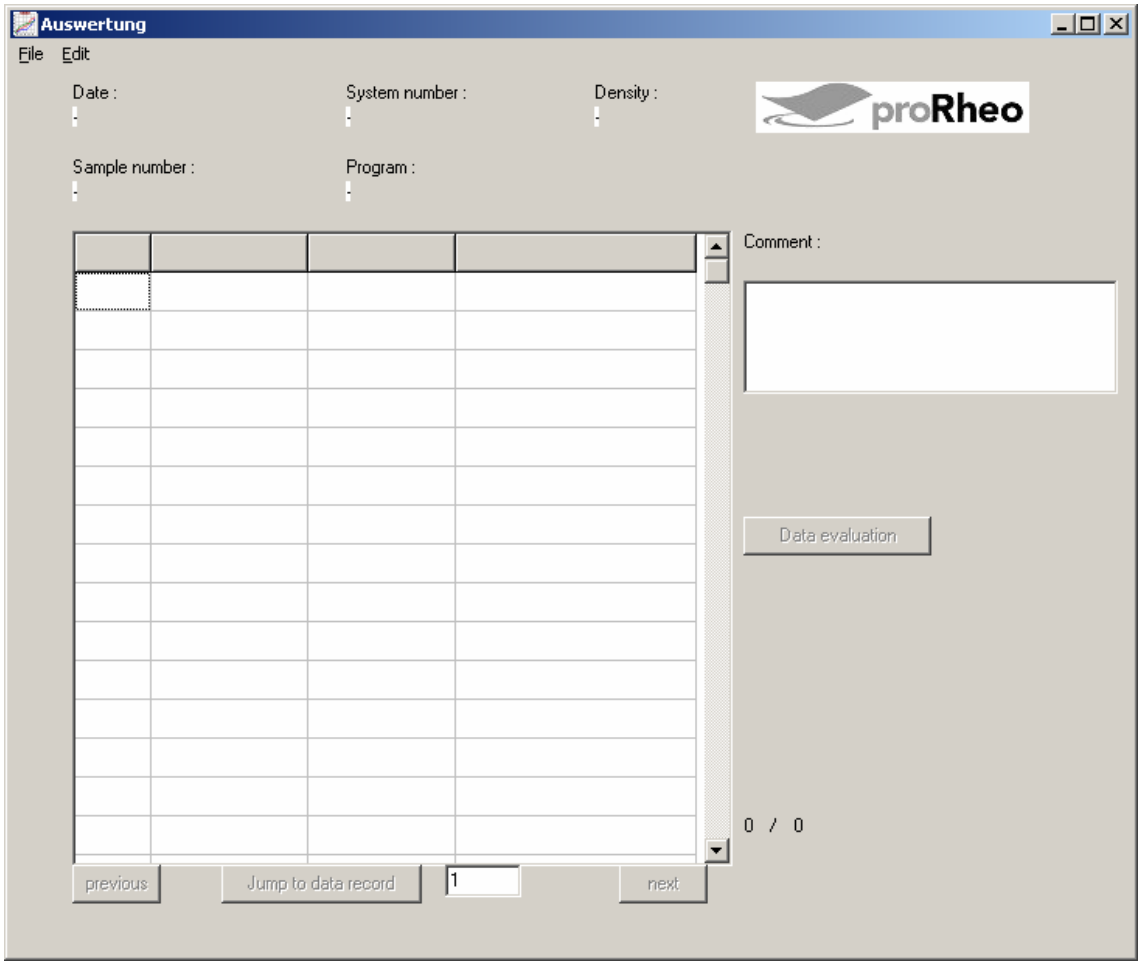


In the upper part of the window you see the settings for data transmission. In case that data transmission does not work, please verify the settings.

Note: The R 180 always transmits all stored data. The data is not deleted by transmitting. Further measurements can be added. The measurement data is deleted only by pressing the “arrow”-key simultaneously to the “power-on”-key.

3 Evaluation

See the following window. The command for opening data is found under „File“



Under „File“ all fuctions are grouped that concern the storage of measurement data.

open: Data stored in internal format can be opened for further treatment.

Save as: by the viscometer read data are stored in internal format.

Save as Excel: The displayed data will be put out in Excel format. The record of each measurement is one sheet on the Excel file.

Save as Text: Output of Data in ASCII- Format. This is a neutral Format that can be read by most programs. For each record one file is produced.

Rhesy A open: Opens records that have been stored with previous software (Rhesy A).

Exit: Closes evaluation progam.

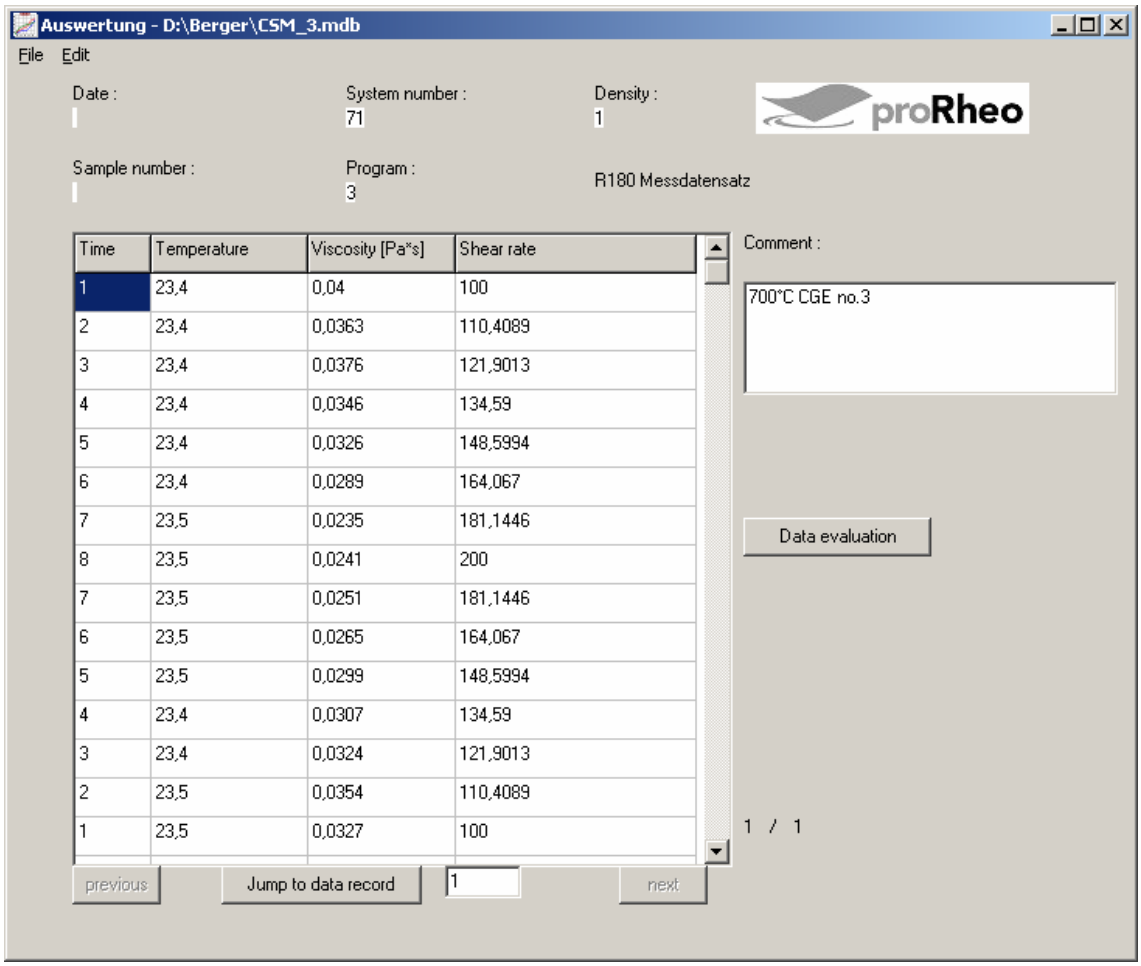
In the blanc area on the right side comments to the measurement can be stored.

3.1 Evaluate Data

3.1.1 Tabular

For the record shown in the display all measured or evaluated values are shown in a tabular.

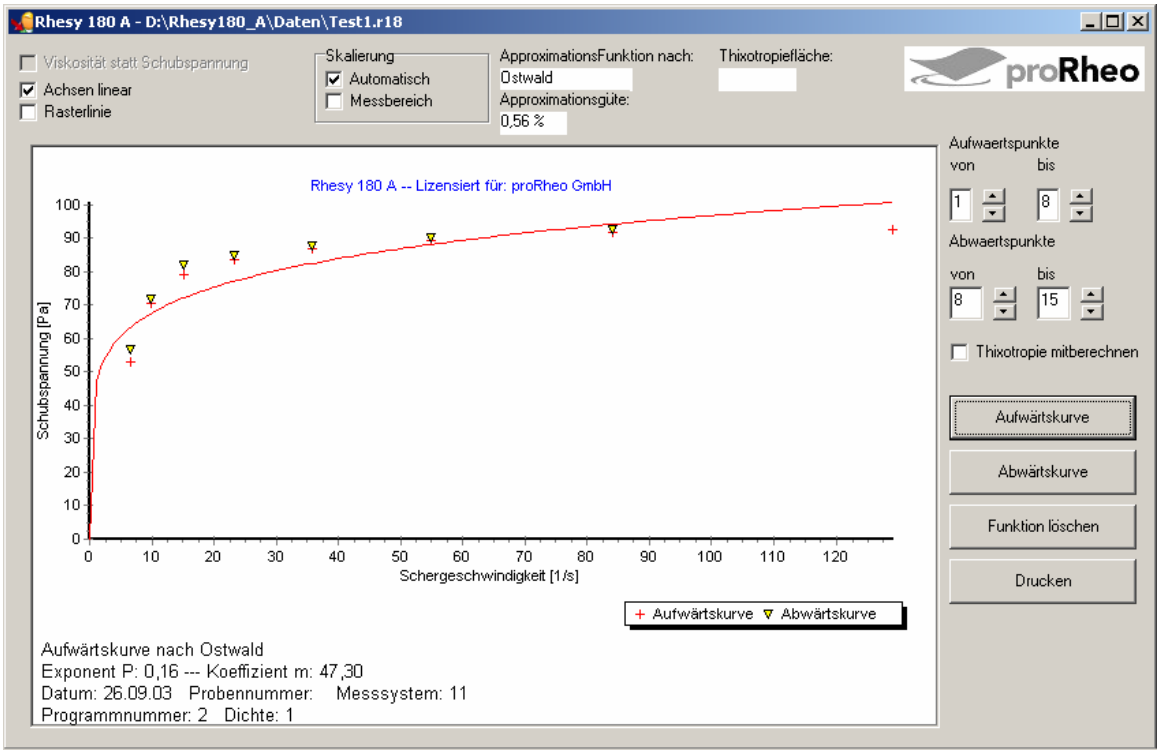
Rheological Hint: Please take care that for all records the torque is higher than 0,5 mNm and less than 9,5 mNm. If this is not the case measurement system or shear rate must eventually be adapted to receive an optimal measurement. Detailed information can be found in the R 180's User Manual.



Basing on this tabular the measurement can be represented graphically or compared with a master function.

3.1.2 Graphic

Clicking on the button „Graphic“, you obtain a graphic representation of the measurement results.



This window offers the following possibilities:

Viscosity instead of shear stress: First you obtain a graphic where shear stress is marked above shear rate. Marking this button you can change the graphic to viscosity above shear rate. This function can only be used if no rheological evaluation is done.

Axes linear: The axes can be divided linear or logarithmic. The graphic should be adapted to the arrangement of the points when taking a flow curve: linear arrangement in flow curve = linear axes and geometric arrangement in flow curve = logarithmic axes.

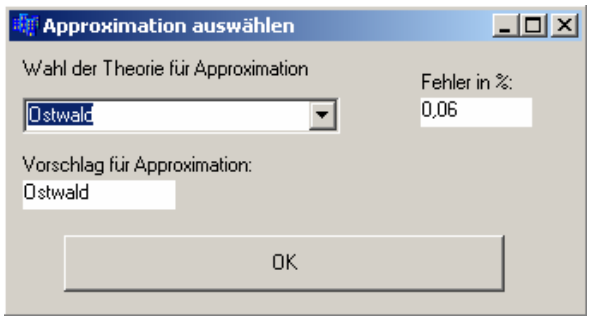
Raster lines: The graphic will be shown with raster lines.

Scaling: „automatic“ Scaling chooses the range in which the flow curve is shown optimally. „Measuring Range“ allows an overview of the R 180 measuring range with the chosen measuring system. The flow curve should be easy to read as well in “Measurement Range“ –modus.

Function of Approximation and Thixotropic Area: 4 models of evaluation are available: Newton, Ostwald, Casson and Bingham. The thixotropic area describes the difference between up and own ramp of the flow curve. Additional Literature: Rheologie, Praxisorientierte Grundlagen und Glossar, Vincentz Verlag, ISBN : 3-87870-449-6

Points up / points down from - to: The entire measuring includes 15 measuring points. Usually the shear rate rises for the first 8 points and decreases from point 8 to 15 back to the starting value.
The calculation of the function of approximation relates either to the flow curve up or to the flow curve down. The number of points that are used for the calculation can be restricted by „from“– “to”.

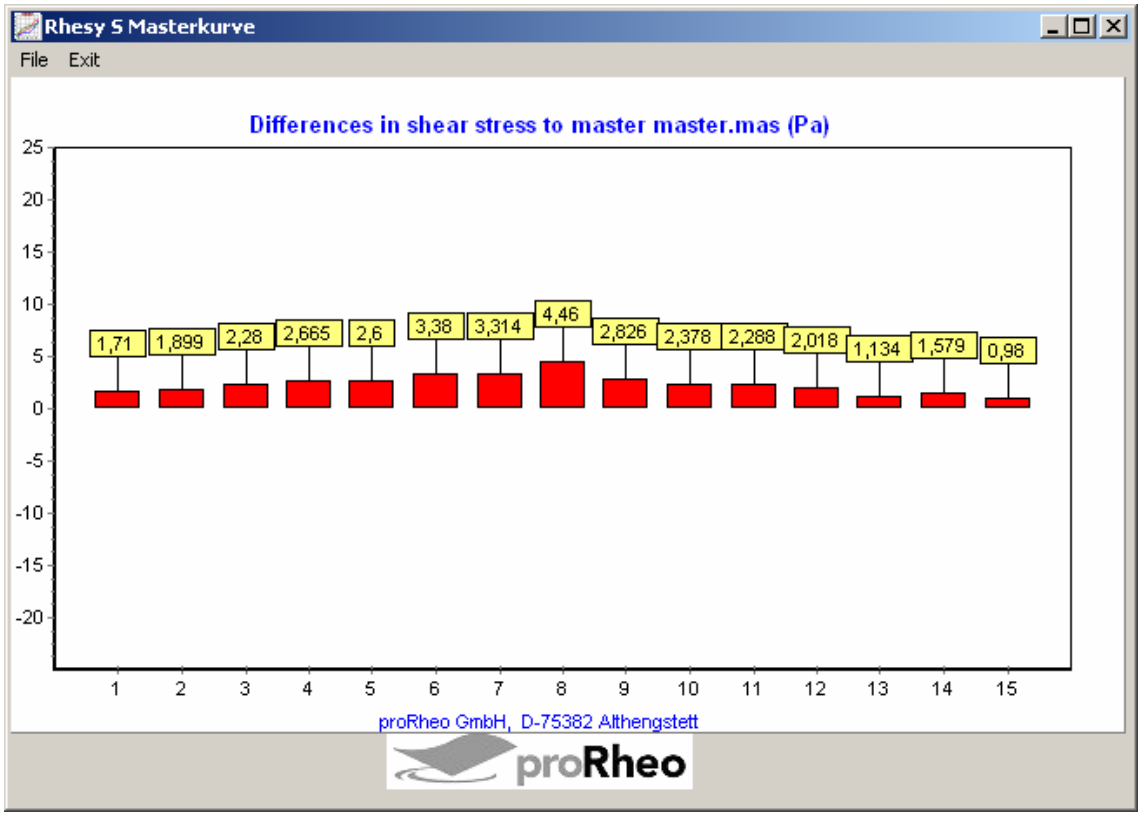
Pressing the button „Flow curve up“or „Flow curve down“ you obtain the following window:



The best approximation for the measuring data is suggestet. It is possible to choose a different rheological model.

3.1.3 Master

Pressing the „Master“-button in the window with the tabular of the measured and calculated data (see 3.1.1), you obtain the following window:



This function allows comparing obtained data with a master file on condition that for both measuring the same steps of shear rate have been used.

Choices in the Pull-down-menu „File“:

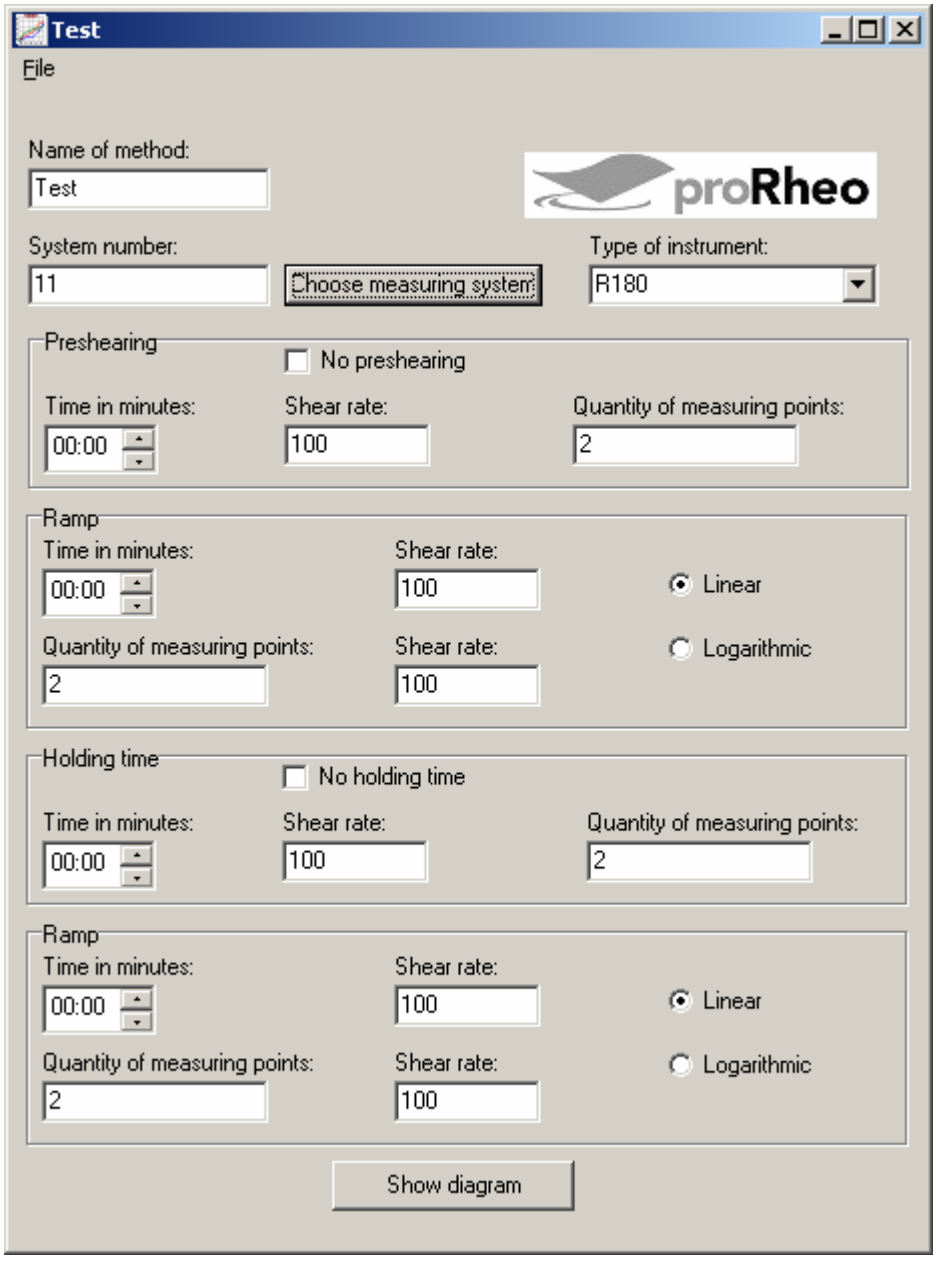
Compare to Master: actual measuring data are compared with a saved master file. Differences are shown in a diagram.

Save as Master: the actual evaluated flow curve will be stored as master file.

Print: The graphic will be printed.

4 Editing Measurement Programs

This window opens:



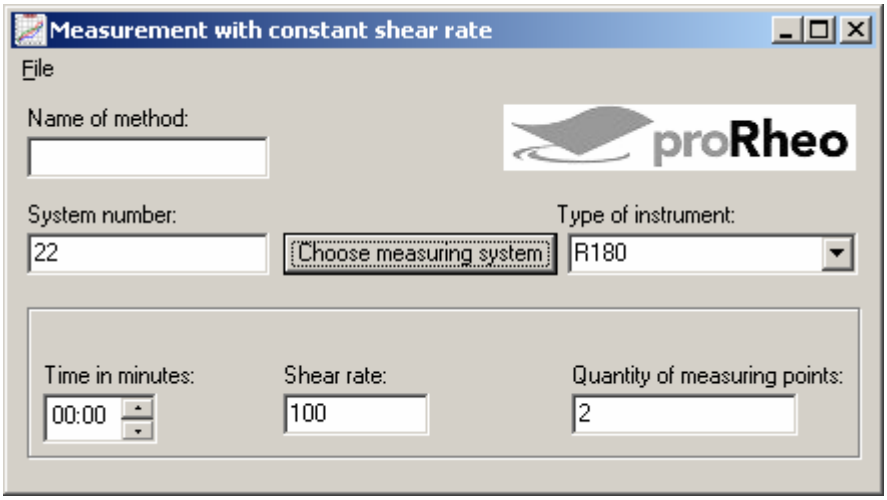
In Pull-down menu „File“ you find:

Open Measuring Instruction: Opens a stored measuring instruction.

Store Measuring Instruction: Stores the now opened measuring instruction.

Delete Measuring Instruction: Allows deleting a stored measuring instruction.

Measurement with constant motor speed: Opens a simplified window for measuring with constant motor speed:



Measuring with constant motor speed requires the following inputs only: time in minutes, shear rate and the number of measuring points.

4.1 Edit Measurement Program

Name of measurement instruction: enter any name you like for the measurement instruction.

Measuring system: Enter the measuring system you want to use. You can choose it as well in the table under „Choose Measuring System“.

Type of Instrument: Choose your type of instrument (R180, RM180, R225 or R325).

4.1.1 Preshearing

Preshearing is a measurement with constant motor speed at the beginning of a measurment process.

No Preshearing: Click here if no preshearing is needed.

Time in Minutes: Enter the desired duration of preshearing.

Shear rate: Enter the desired shear rate.

Number of Measuring Points: Enter the number of measuring points during preshearing.

4.1.2 Ramp

By a ramp the shear rate is lowered or heightened depending on a time factor.

Shear rate 1: Enter the shear rate desired for starting.

Shear rate 2: G Enter the desired shear rate for finishing.

Number of Measuring Points: Enter the desired number of measuring points for the ramp.

Linear/Geometric: Choose how the measuring points are shown: linear for an equivalent sharing of the measuring points or geometric, where the distance between the measuring points is smaller in the lower range of shear rates.

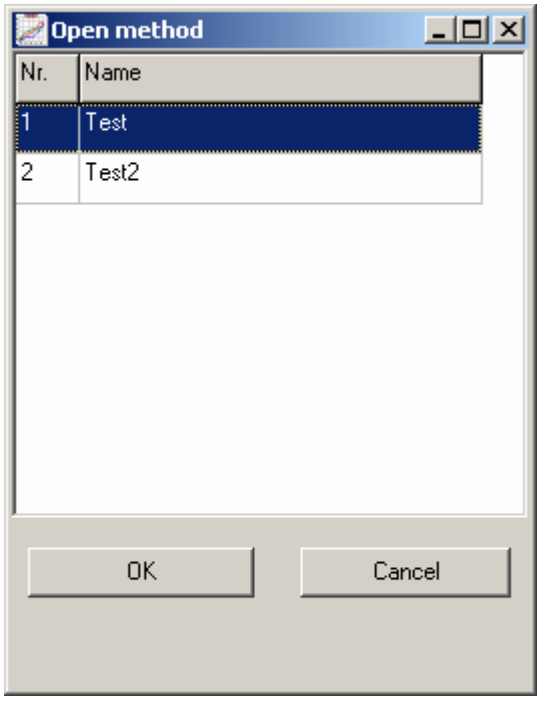
4.1.3 Stop time

The Stop time is the time with constant shear rate between the two ramps.

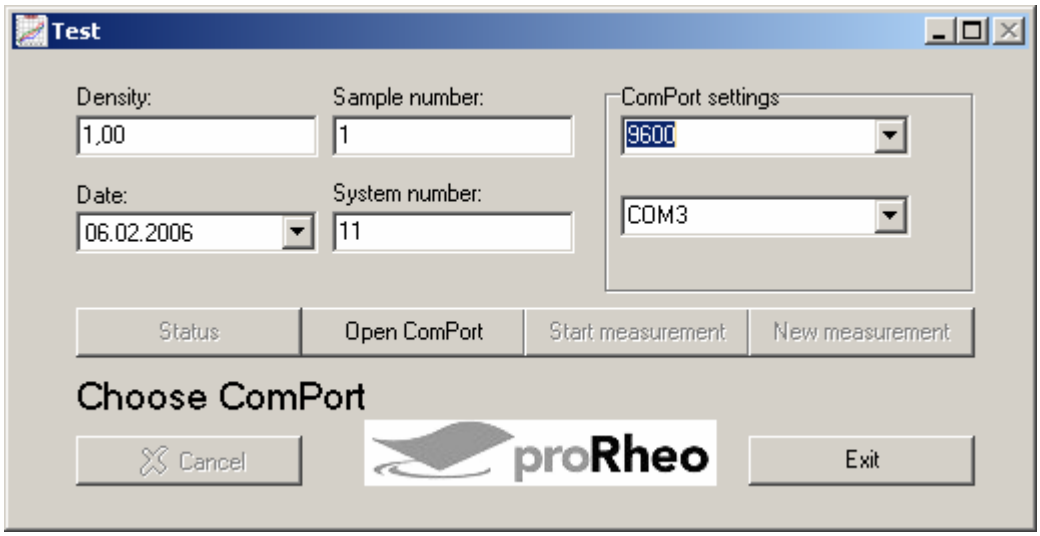
Show Diagram: Shows the set up measurement instruction as a graphic.

5 Start Measurement Program

Open a measurement instruction in the window „Open Measurement Instruction“. This instruction must have been set up before, see Chapter 4.



Now complete the following window:



Sample Number: Enter a free to determin sample number.

Measuring system: The measuring system is already defined by the measuring instruction (Chapter 4) and will be filled in automatically.

5.1 Com Port Settings

First choose the baud rate. For the „old“ RM 180 it is always 2400. For any other instrument the rate can be chosen and usually set on 9600. Then choose the Com Port to which the instrument is connected (usually Com1 or Com2). Now press the button “Open Com Port” and then “Start Measurement” to start the measurement.

6 Tips und Tricks

No contact between R 180 and software

- Check baud rate. Are the settings the same in software and R 180?
- Cable: Original cable in use?
- COM Port settings ok in software?
- Verify if the software was started repeated.

No License

- Copy the file R180.ini from the installation CD into the file where the executing program R180.exe is installed.
- Install program again

Data evaluation shows error: Not a valid number.

- Change pre settings in the system.
- Check Measuring system file. Are only measurement system numbers used for which KD and KTau have been defined?

Program doesn't run.

- Check which operating system is installed on your computer.
- Update operating system.

For further questions please contact:

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