



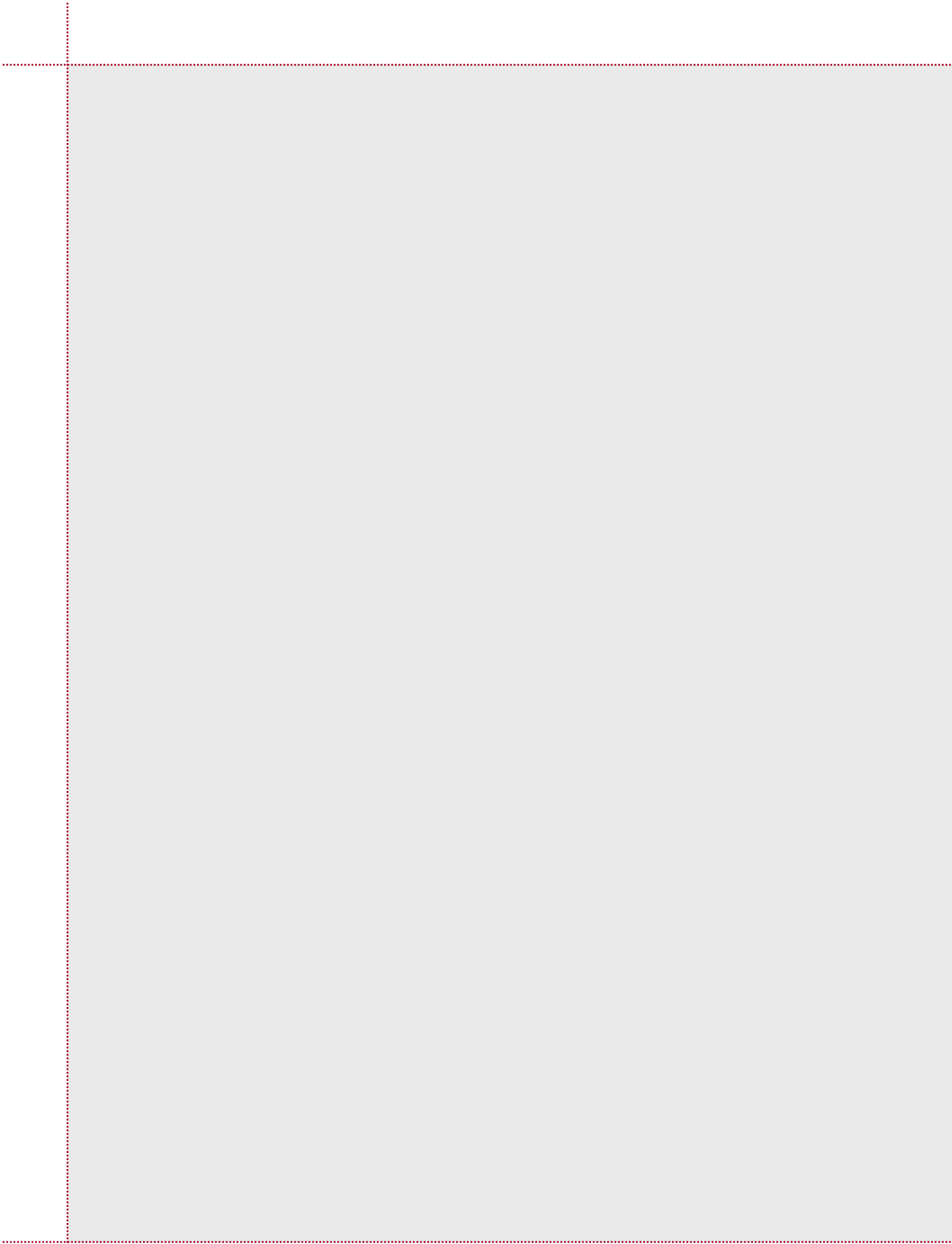
ENGTECH

ENGINEERING & TECHNICS

analyse & measure

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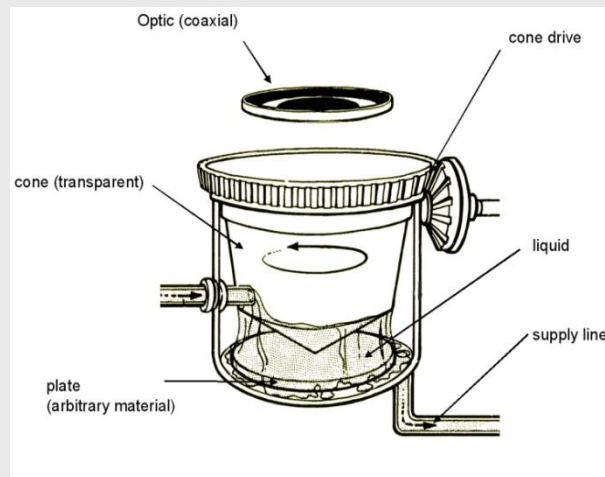
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PRINCIPLES

the online rheometer



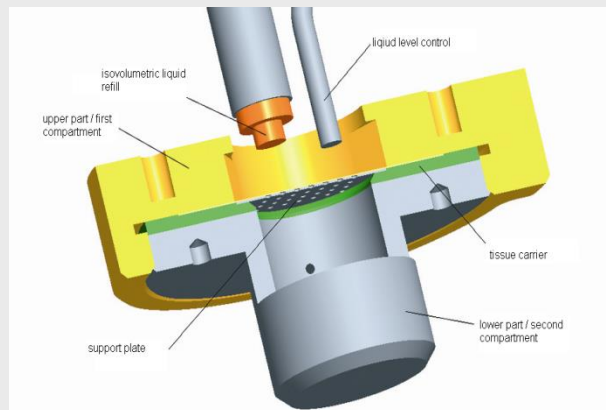
Principle of the cone plate rheometer:

The cone plate core of the system is shown on the picture. The plate is fixed and is made of the material to be tested. The liquid between cone and plate either contains cell culture media with cells in order to assess the adherence of the cells to the plate surface, while the cone is rotating or at rest. Alternatively the liquid contains whole blood or parts thereof (e.g. platelets) making the examination of the clotting/thrombus formation, erythrocyte destruction (hemolysis) or the complement activation possible. Of course it is still possible to grow cells on the plate, first under static conditions and then to expose the cells on the biomaterial surface to different levels of shear stress.

rheoLive and its applications:

- cell culture
- material researches
- investigations of biocompatibility
- hemorheology
- thrombogenesis
- osteosynthesis

measure the nano permeability



Principle of the permeability system:

The function of the system is shown on the picture. On top of the tissue you have a defined volume of liquid. The liquid will be exposed to pressure as a stimulus. The pressure gradient between upper and lower part of the examination box (main unit) will force the tissue to pass the liquid. It is still possible to stimulate the tissue not by pressure then by a different liquid stimulus injected from the upper side. The loss of liquid will be recorded by the liquid level sensor and this starts the isovolumetric level control to refill passed medium. The volume on top of the tissue is known as well as the volume above the tissue. The volume gap between upper and lower volume represents the volume staying in the tissue. All parameters and data are documented in a data file, that is very easy to convert in a diagram.

The various ways to stimulate the tissue, the possibility to integrate a camera system and the consistent documentation of parameters and data allow to get high quality facts of the tissue. This process is the platform or baseline for your special requirements. Ask us for more information about customizing.

nanoPerm and its applications:

- cell culture
- tissue engineering
- examinations of tissues made of biological and technical material
- filter techniques
- diaphragm development
- pharmaceutical issues

rheoLive - the online rheometer



rheoLive is a rheological System including a single examination box. A transparent cone and a camera microscope combination are integrated. This offers the possibility to observe and record the incidents during the examination. Consequently the user is able to get a consistent documentation of the measurement and a temporal attachment with the incidents. Measurements with „before and after pictures“ are bygone.

Specials:

All parameters of the examination box „MainUnit“, e.g. shear stress or temperature, can be modified and documented individually. This ensures the reproduction of all analyse results. The program “RheoControl” guarantees a continuous management of all acquired data and parameters. The integrated camera microscope combination records single pictures, sequences or short movies on demand during the measurement. The cone plate arrangement can be equipped with plates of any material.

Technical data**System performance rheoLive:**

Shear stress range:	0,5..25 dyn/cm ² (default)
Shear stress steps:	0,1 dyn/cm ²
Temperature range:	Room temperature .. +50 °C
Temperature steps:	0,1 °C
Picture formats:	TIFF, BMP, JPG
Min. sequence range:	1 pic. per hour
Max. sequence range:	4 pic. per hour
Pixels per picture:	752 x 564 Pixel
Zoom factor range:	ca. 80x ... 1000 (depending on monitor resolution)
Motor drive zoom:	possible
Autofocus:	possible
Monitor:	15"-TFT or 17"-TFT

Circuit points and power:

Supply voltage:	230V~
Power consumption:	300WAC
Monitor:	15"-TFT
Periphery ports:	1x USB
Additional ports:	RS232, Ethernet (RJ45), PS2

Component and System cleaning:

Glas cone:	sterilizable
Examination unit (taken apart):	all components sterilizable
System surfaces:	washable with alcohol

Measure and weight:

Width/Depth/Height:	650 mm/400 mm/500 mm
Weight:	ca. 30 kg
Required floor space:	800 mm/600 mm

rheoBasic - the triple rheometer



rheoBasic is a rheological System including three independent examination boxes. A transparent cone and a moveable camera microscope combination are integrated. This offers the possibility to observe and record the incidents during the examination. Consequently the user is able to get a consistent documentation of the measurement and a temporal attachment with the incidents. Measurements with „before and after pictures“ are bygone.

Specials:

All parameters of the examination box „MainUnit“, e.g. shear stress or temperature, can be modified and documented individually. This ensures the reproduction of all analyse results. The program “RheoControl” guarantees a continuous management of all acquired data and parameters. The integrated camera microscope combination records single pictures, sequences or short movies on demand during the measurement. The cone plate arrangement can be equipped with plates of any material.

Technical data**System performance rheoBasic:**

Shear stress range:	0,5..25 dyn/cm ² (default)
Shear stress steps:	0,1 dyn/cm ²
Temperature range:	Room temperature .. +50 °C
Temperature steps:	0,1 °C
Picture formats:	TIFF, BMP, JPG
Min. sequence range:	1 pic. per hour
Max. sequence range:	4 pic. per hour
Pixels per picture:	752 x 564 Pixel
Zoom factor range:	ca. 80x ... 1000 (depending on monitor resolution)
Motor drive zoom:	possible
Manuel zoom:	possible
Autofocus:	possible
Monitor:	15"-TFT or 17"-TFT
Assessment chambers:	3 (parallel working)
Camera Positioning System:	5 positions per examination place

Circuit points and power:

Supply voltage:	230V-
Power consumption:	300VAC
Monitor:	15"-TFT
Periphery ports:	1x USB
Additional ports:	RS232, Ethernet (RJ45), PS2

Component and System cleaning:

Glas cone:	sterilizable
Examination unit (taken apart):	all components sterilizable
System surfaces:	washable with alcohol

Measure and weight:

Width/Depth/Height:	700 mm/600 mm/600 mm
Weight:	ca. 70 kg
Required floor space:	1100 mm/700 mm

nanoPerm - measure the nano permeability



nanoPerm is a system to characterize tissues. It can measure the permeability and leakage of all kind of biological or technical tissues. The system includes a single examination box. Its online data acquisition and processing offers the user the opportunity to get in contact with the analyse at any moment.

Specials:

All parameters of the examination box „MainUnit“, e.g. pressure or temperature, can be modified and documented individually. This ensures the reproduction of all analyse results. The program “PermControl” guarantees a continuous management of all acquired data and parameters. It is very easy to convert the acquired data into diagrams, which can be used for the following interpretation.

Technical data**System performance nanoPerm:**

Pressure range:	0 .. 200 mm Hg (default)
Pressure steps:	1 mm Hg
Higher pressure range:	up to .. 1,5 bar (more on inquiry)
Pressure:	bar, mmHg, hPa
Temperature range:	room temperature .. +50°C
Temperature Steps:	0,1°C
Min. dosing volume:	ca. 1,5 µl (depending on fluid)
Tissue diameter:	Ø 23mm

Medium parameters:

Permitted viscosity:	0,4 .. 50 mPas
Permitted particle size:	< 5 µm

Laser based liquid level indicator:

Laser type:	Class II
Measuring range:	20 mm
Center distance:	40 mm
Resolution:	2 µm
Resulting volume resolution (typical)	100 nl (standard sample size)

Circuit points and power:

Supply voltage:	230V~
Power consumption:	300WAC
Monitor:	15"-TFT
Periphery ports:	USB
Additional ports:	RS232, Ethernet (RJ45), PS2

Component and System cleaning:

Examination Unit (taken apart):	all components sterilizable
System surfaces:	washable with alcohol

Measure and weight:

Width/Depth/Height:	650 mm/400 mm/500 mm
Weight:	ca. 30 kg
Required floor space:	800 mm/600 mm

SOFTWARE

rheoControl – software to run the rheological assessment

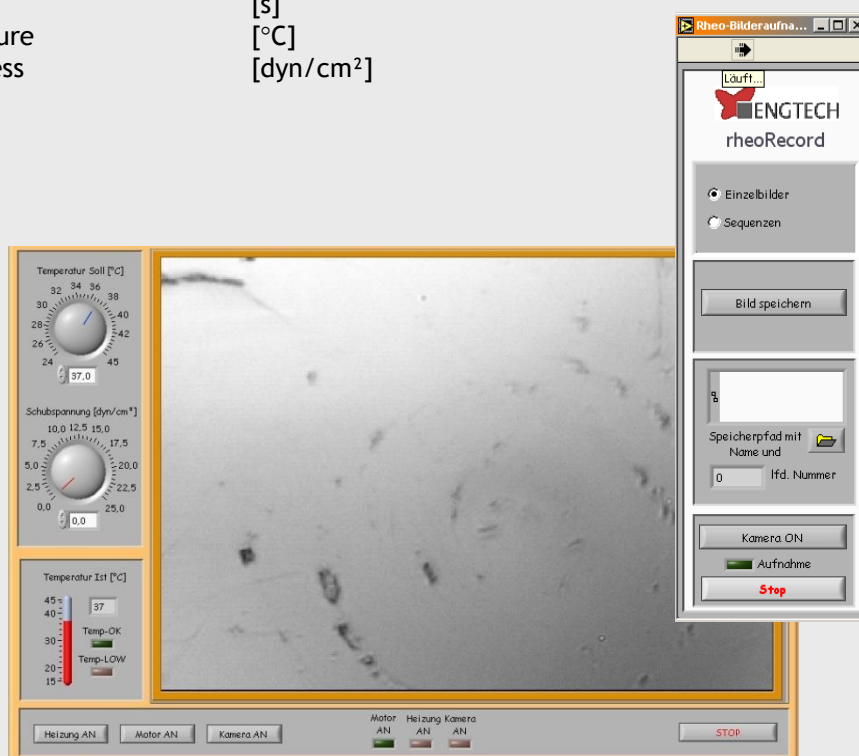
rheoControl is the standard software to control your rheological assessment. rheoControl allows you to set the parameters up and to acquire the data from the measuring chamber. In combination with rheoRecord the camera handling is also included. All incidents are recorded chronologically in a file created automatically by the software. The picture recording works chronologically as well and uses the same prefix for the dataname. Thereby the combination of the pictures and the saved data is very easy. After your parameter setup the software runs your rheoLive-system automatically.

Setup Parameters:

- temperature [°C]
- shear stress [dyn/cm²]
- picture mode [picture / sequence]
- record mode [picture per minute]

Acquired data:

- time [s]
- temperature [°C]
- shear stress [dyn/cm²]



rheoControl-3h – software to run the triple head system

rheoControl-3h is an increased version of the standard software rheoControl. Here you have all steering tools to handle three parallel assessment chambers and the moveable camera system. It still allows you to set the parameters up and to acquire the data from the measuring chamber, for any assessment chamber separately. In combination with rheoRecord, all incidents are recorded chronologically in a file created automatically by the software. After your parameter setup the software runs your rheoLive-system and the camera handling automatically.

Setup Parameters:

- temperature [°C]
- shear stress [dyn/cm²]
- picture mode [picture / sequence]
- record mode [picture per minute]

Acquired data:

- time [s]
- temperature [°C]
- shear stress [dyn/cm²]



SOFTWARE

permControl - software to measure the permeability

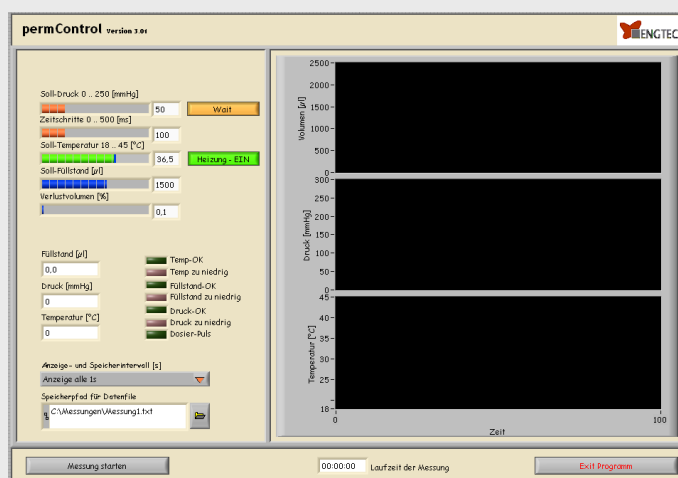
permControl is the standard software to measure the permeability of your tissue or membran. permControl allows you to set the parameters up and to acquire the data from the measuring chamber . All incidents are recorded in a file created automatically by the software. After your parameter setup the software runs your nanoPerm-System automatically.

Setup parameters:

- temperature [°C]
- pressure [mmHg]
- medium Volume [μl]
- leakage gap to refill [% of medium vol.]
- time (assessment start) [s]

Acquired data:

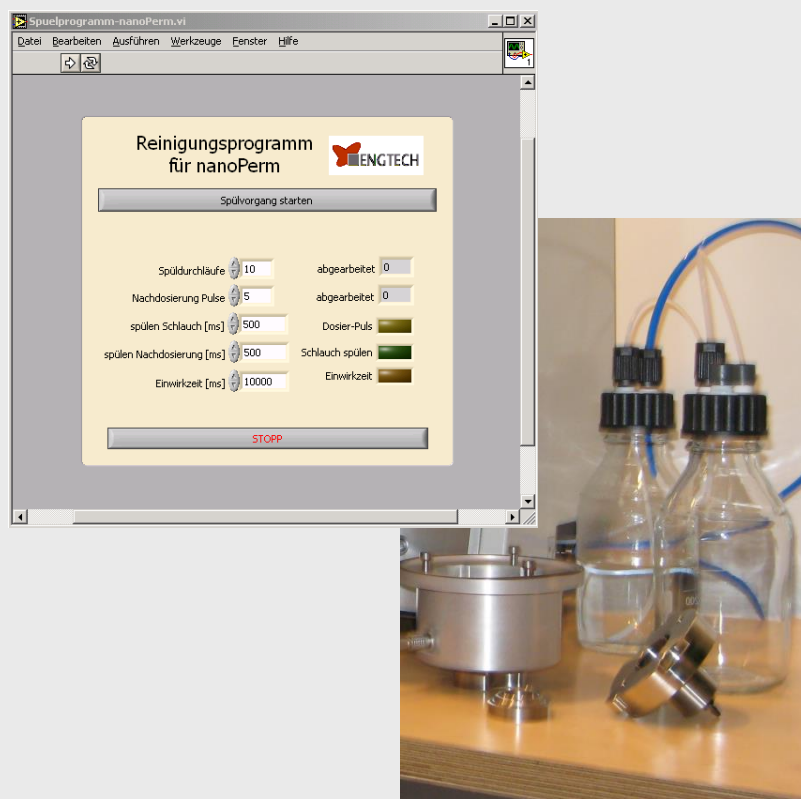
- time [s]
- liquid level [μl]
- total leakage volume [μl]
- pressure [mmHg]
- temperature [°C]



nanoPerm-clean up - software to clean the permeability system

nanoPerm is delivered with its own cleaning program. The software starts a cleaning procedure that can be altered to the different liquid or medium types used during your assessment.

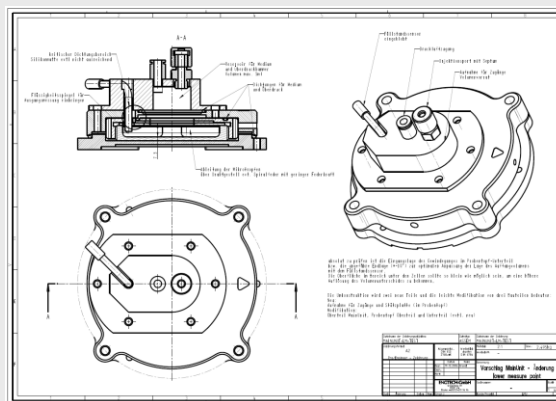
The cleaning software can be used as a standalone tool or as an integrated part of your automated assessment procedure.



NOTES

A large, empty rectangular area with a light gray background, intended for writing notes. It is bounded by a dotted red line on the top, left, and bottom edges.

Customizing by ENGTECH-analytics



Our systems are all designed as a basic platform to be altered to your applications. This maximized flexibility is to be seen in a flexible price structure as well. A lot of combinations can be arranged to match your system requirements perfectly.

Here are some modification topics for rheoLive as well as for nanoPerm:

- Integration of high-end-visualization tools
- Improved data check
- Increased grade of automation
- Integration of further sensors, e.g. pH, pO₂..
- Direct adaption to additional technologies, e.g. HPLC
- Combination of permeability and rheology
- ...

On the following pages you find some examples of possible system modifications. Of course, we would be pleased to give you advice.

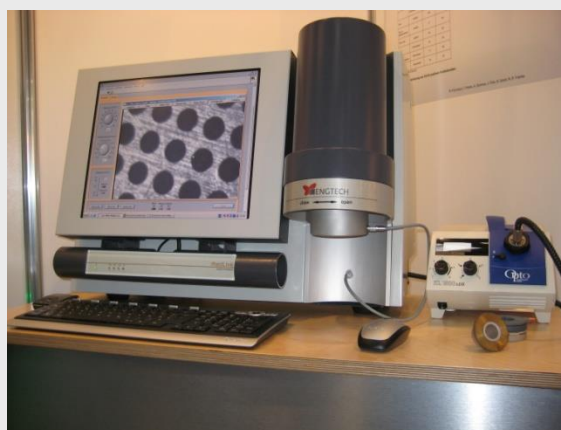
Please contact ENGTECH-analytics via info@engtech-gmbh.de !

EXAMPLES

rheoBasic with additional analytic ports and pressure control



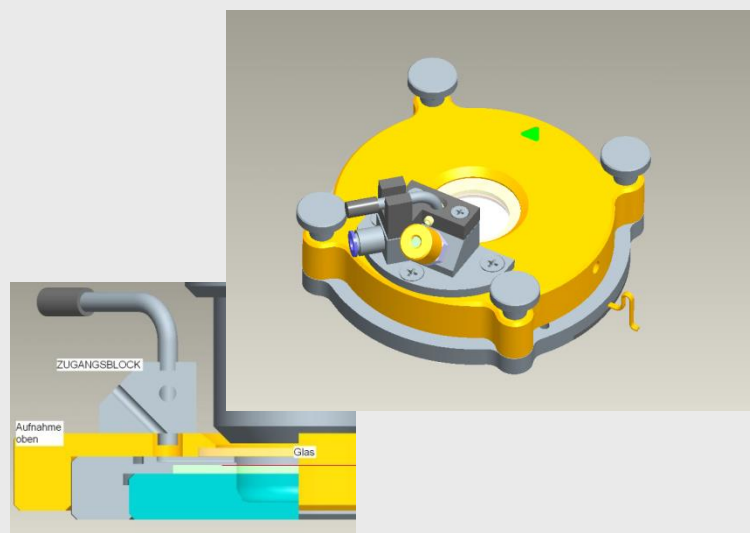
rheoLive with motorized zoom and autofocus



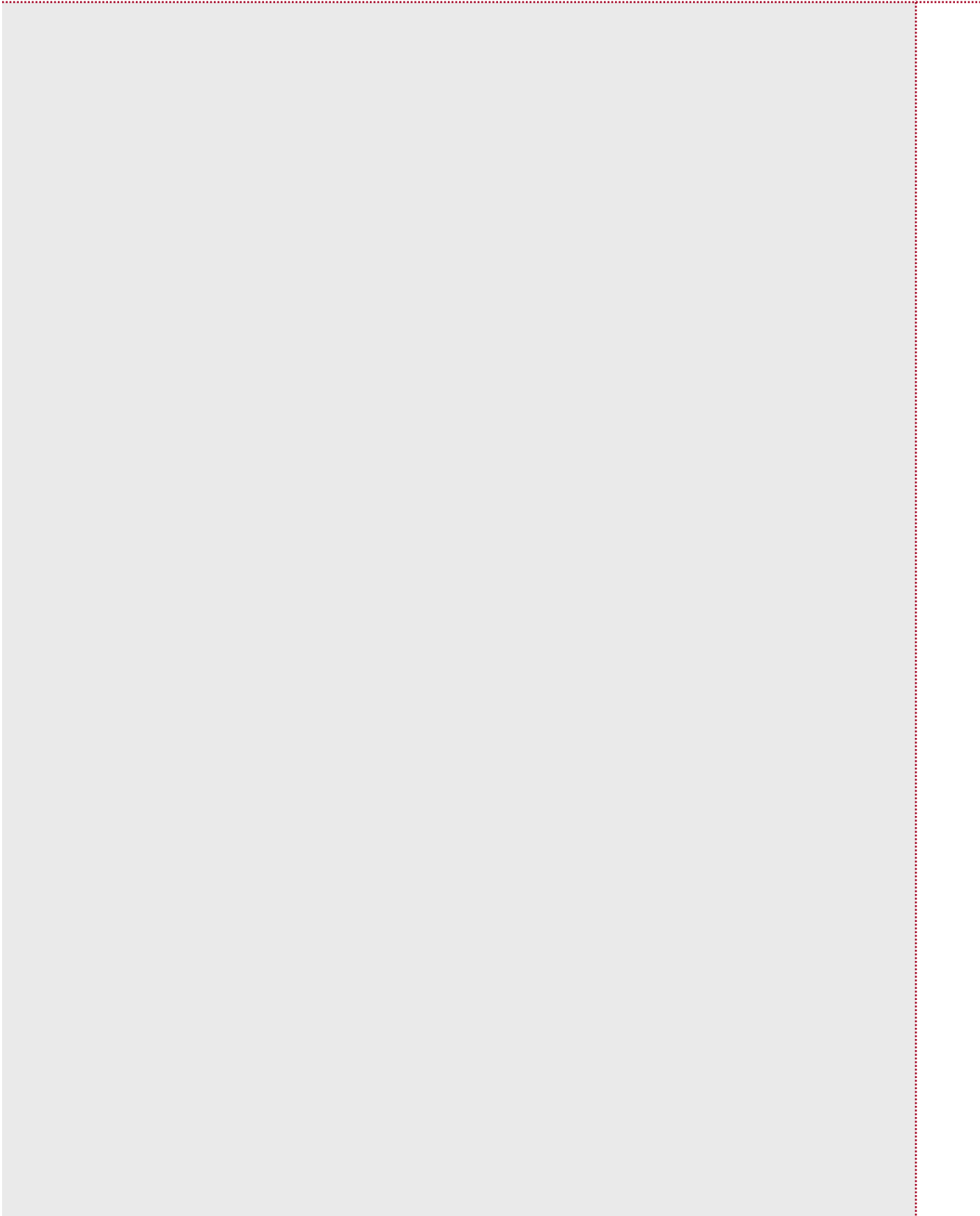
rheoControl special camera positioning panel for fully automated picture recording, used by long-term assessments



nanoPerm with optimized sample height to integrate the complete main unit in a fluorescence microscope, additional injection port



NOTES



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