



Product overview

...Innovative
testing solutions
made in
Germany!

A MonTech berendezések
magyarországi forgalmazását a
Senselektro Kft. látja el.
www.senselektro.hu
senselektro@senselektro.hu



Testing instruments



Laboratory Equipment



Software systems



Service



Consulting



Contents

Rheometer

| | |
|-------------------------|----|
| ▶ MDR 3000 Basic | 6 |
| | .. |
| ▶ MDR 3000 | 8 |
| | .. |
| ▶ MDR 3000 Professional | 10 |
| | .. |
| ▶ D-MDR 3000 | 12 |
| | .. |
| ▶ D-RPA 3000 | 14 |
| | .. |

Ozone

| | |
|------------|----|
| ▶ TOM 3000 | 16 |
| | .. |

Mooney Viscometer

| | |
|-----------------|----|
| ▶ MV 3000 Basic | 18 |
| | .. |
| ▶ V-MV 3000 | 20 |
| | .. |

Test sample preparation

| | |
|-------------|----|
| ▶ R-VS 3000 | 24 |
| | .. |
| ▶ M-VS 3000 | 25 |
| | .. |
| ▶ P-VS 3000 | 26 |
| | .. |
| ▶ CP 3000 | 27 |
| | .. |

Hardness & Density

| | |
|------------|----|
| ▶ H&D 3000 | 28 |
| | .. |
| ▶ RD 3000 | 30 |
| | .. |

Dispersion

| | |
|---------------------|----|
| ▶ DisperTester 3000 | 32 |
| | .. |

Software sytems

| | |
|--------------|----|
| ▶ MonControl | 34 |
| | .. |
| ▶ MonStat | 35 |
| | .. |
| ▶ MonRecipe | 36 |
| | .. |
| ▶ MonQuality | 36 |
| | .. |
| ▶ Networking | 37 |
| | .. |

Service and Calibration

| | |
|-------------------------------------|----|
| ▶ Service, maintenance, calibration | 38 |
| | .. |
| ▶ Modernization | 38 |
| | .. |
| ▶ Spare parts und special foil | 38 |
| | .. |

About us

| | |
|---------------------------------------|----|
| ▶ MonTech Werkstoffprüfmaschinen GmbH | 39 |
| | .. |



Overview Rheometer

All instruments are also available with various automation options such as:

- 5 or 10 samples linear
- 24 or 48 samples tray
- 10x 24 or 48 samples tray changer



PERFORMANCE

MDR 3000 Basic

MDR 3000

MDR 3000 Professional

D-MDR 3000

D-RPA 3000

Technical specification

| | MDR 3000 Basic | MDR 3000 |
|--------------------------|--|--|
| International standards | ISO 6502, ASTM D 5289, DIN 53529 | ISO 6502, ASTM D 5289, DIN 53529 |
| Test chamber | Biconical, closed System | Biconical, closed System |
| Oscillation frequency | 1,667 Hz | 1.667 Hz |
| Oscillation amplitude | Mechanically adjustable, 0.2°, 0.5°, 1° or 3° | Programmable via Software, 0.2° to 5° |
| Temperature control | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled (Pneumatic single channel cooling system optional) | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled (Pneumatic double channel cooling system optional) |
| Temperature check system | Recordings of the temperature gradient on the screen, microprocessor monitored | Recordings of the temperature gradient on the screen, microprocessor monitored |
| Units | Torque (dNm, lbf.in, kgf.cm), Temperature (°C, °F), Pressure (bar, kg per cm ²), Time (min - min / min - sec), Shear rate (1/s, rad/s) | Torque (dNm, lbf.in, kgf.cm), Temperature (°C, °F), Pressure (bar, kg per cm ²), Time (min - min / min - sec), Shear rate (1/s, rad/s) |

➤ (See page 6)

➤ (See page 8)

| MDR 3000 Professional | D-MDR 3000 | D-RPA 3000 |
|--|--|--|
| ISO 6502, ASTM D 5289, ASTM D 6204, ASTM D 6601, DIN 53529 | ISO 6502, ASTM D 5289, ASTM D 6204, ASTM D 6601, DIN 53529 | ISO 6502, ASTM D 5289, ASTM D 6204, ASTM D 6601, DIN 53529 |
| Biconical, closed System | Biconical, closed System | Biconical, closed System |
| 0,001 Hz to 33 Hz 0,01° to 20° | 0,001 Hz to 100 Hz 0,001° to 180° | 0,001 Hz to 100 Hz 0,0001° to 180° |
| Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled (Pneumatic double channel cooling system standard) | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled (Pneumatic double channel cooling system standard, low-temperature cooling systems) | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled (Pneumatic double channel cooling system standard, low-temperature cooling systems) |
| Recordings of the temperature gradient on the screen, microprocessor monitored | Recordings of the temperature gradient on the screen, microprocessor monitored | Recordings of the temperature gradient on the screen, microprocessor monitored |
| Torque (dNm, lbf.in, kgf.cm), Shear modulus (Pa, dynes/cm ² , psi), Dynamic viscosity (Pa s), Temperature (°C, °F), Pressure (bar, kg per cm ²), Time (min - min / min - sec), Frequency (Hz, cpm), Shear rate (1/s, rad/s) | Torque (dNm, lbf.in, kgf.cm), Shear modulus (Pa, dynes/cm ² , psi), Dynamic viscosity (Pa s), Temperature (°C, °F), Pressure (bar, kg per cm ²), Time (min - min / min - sec), Frequency (Hz, cpm), Shear rate (1/s, rad/s) | Torque (dNm, lbf.in, kgf.cm), Shear modulus (Pa, dynes/cm ² , psi), Dynamic viscosity (Pa s), Temperature (°C, °F), Pressure (bar, kg per cm ²), Time (min - min / min - sec), Frequency (Hz, cpm), Shear rate (1/s, rad/s) |

➤ (See page 10)

➤ (See page 12)

➤ (See page 14)



MDR 3000 Basic

Moving Die Rheometer

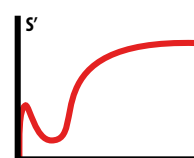


The MDR 3000 Basic

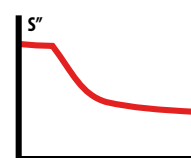
is designed for measuring the viscoelastic properties of polymers and elastomeric compounds before, during and after cure. The acquired data is giving exact information about the processability, the cure characteristics, the cure speed, as well as the behaviour of the compound after-cure.

- ▶ The testing instrument consists of the machine case, a PC with screen, keyboard and mouse as well as a printer.
- ▶ The data acquisition and the controlling of the testing instrument is made by the PC by means of the MonControl analysis software. For the storage and analysis of the measurement data a modern SQL database structure is provided.
- ▶ Due to the rugged and flexible construction of the MDR 3000 Basic this device can be used for quality control purposes not only in the laboratory, but also directly in the production area.

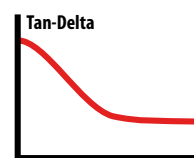
Determinable results



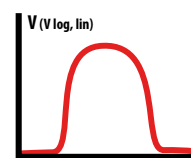
Elastic Modulus



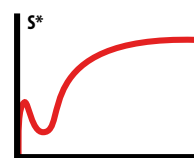
Viscous Modulus



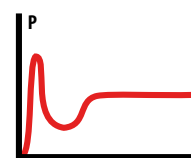
Tan - Delta



Vulcanization speed



Complex Modulus



Pressure
(optional available)

Technical specification

| | |
|---|--|
| International standards | ISO 6502, ASTM D 5289, DIN 53529 |
| Test chamber | Biconical, closed System |
| Die gap | 0.45 mm nominal |
| Force measurement | Torque transducer mounted at the upper test chamber Pressure measurement optional |
| Closing system | Soft closing to prevent foil rips and damage of test samples |
| Oscillation frequency | 1.667 Hz |
| Oscillation amplitude | Mechanically adjustable, 0.2°, 0.5°, 1° or 3° |
| Torque range | 0.01 to 235 dNm |
| Sample volume | approx. 4.5 cm ³ |
| Temperature control system | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled (Pneumatic single channel cooling system optional) |
| Temperature check system | Recordings of the temperature gradient on the screen, microprocessor monitored |
| Units | Torque (dNm, lbf.in, kgf.cm), Temperature (°C, °F) Pressure (bar, kg per cm ²), Time (min - min / min - sec) Shear rate (1/s, rad/s) |
| Pneumatics | min. 5 Bar |
| Electrical | Single phase 220 V - 230 V, 5 Amps |
| Rugged solid metal case, heavy-duty type | |
| Connection possibility for suction (Ø 100 mm) | |
| Net weight approx. 130 kg | |



MDR 3000

Moving Die Rheometer



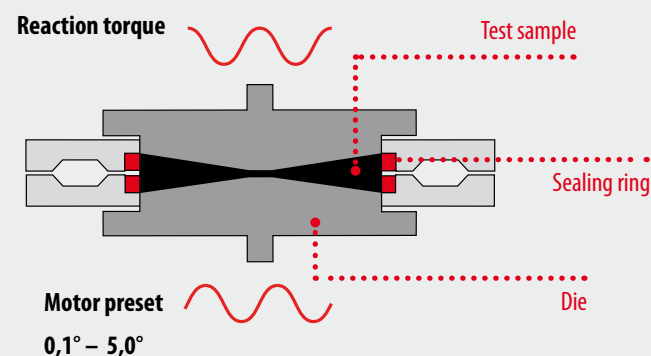
MDR 3000

is used for the determination of vulcanization behaviour, vulcanisation speed as well as determination of after-cure properties.

- The instrument utilizes a direct torque drive system. Therefore the oscillation angle can be directly changed in the Software
- The torque measurement is performed by a high resolution torque transducer.

Test chamber system

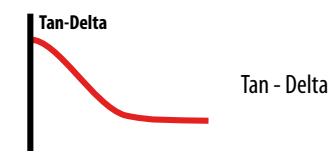
- The drive shaft of the lower die is directly connected to a high-precision, gearless torque motor. The positioning of the drive is monitored and controlled by the PC and the Software.
- The instrument is equipped with a completely closed, biconical test chamber system.



Determinable measurements



Elastic Modulus



Tan - Delta



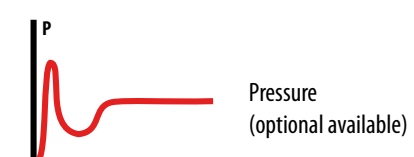
Complex Modulus



Viscous Modulus



Vulcanization speed



Pressure (optional available)

Technical specification

| | |
|----------------------------|--|
| International standards | ISO 6502, ASTM D 5289, DIN 53529 |
| Test chamber | Biconical, closed System |
| Die gap | 0.45 mm nominal |
| Force measurement | Torque transducer mounted at the upper test chamber Pressure measurement optional |
| Closing system | Soft closing to prevent foil rips and damage of test samples |
| Oscillation frequency | 1.667 Hz |
| Oscillation amplitude | Programmable via Software, 0.1° to 5° |
| Torque range | 0.01 to 235 dNm |
| Sample volume | approx. 4.5 cm ³ |
| Temperature control system | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled (Pneumatic double channel cooling system optional) |
| Temperature check system | Recordings of the temperature gradient on the screen, microprocessor monitored |
| Units | Torque (dNm, lbf.in, kgf.cm), Temperature (°C, °F) Pressure (bar, kg per cm ²), Time (min - min / min - sec), Shear rate (1/s, rad/s) |
| Pneumatics | min. 5 Bar |
| Electrical | Single phase 220 V - 230 V, 5 Amps |



MDR 3000 Professional

Professional Moving Die Rheometer



The MDR 3000 Professional

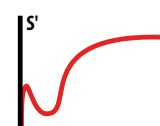
is designed for measuring the viscoelastic properties of polymers and elastomeric compounds before, during and after cure. The acquired data is giving exact information about the processability, the cure characteristics, the cure speed, as well as the behaviour of the compound at the after-cure.

The MDR 3000 Professional fulfils the complete range of all test requirements: Polymer or raw materials as well as basic, finished and cured compounds can be characterized. Besides the cure properties the cure characteristic and the processability can be determined and evaluated.

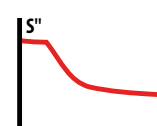
Due to the rugged and flexible construction of the MDR 3000 Professional this device can be used for extended quality controls purposes not only in the laboratory, but also directly in the production area.

The high flexibility of the MDR 3000 Professional allows the user to program and execute arbitrary test sequences with the MonControl Analyses Software. Isothermal tests, non-isothermal tests, amplitude sweeps, frequency sweeps, temperature sweeps, shear rate sweeps, relaxations, retardations, hysteresis and tension tests can be defined and executed, as well as any combination of each sequences.

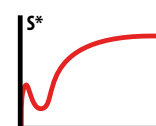
Determinable measurements



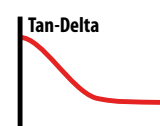
Elastic Torque



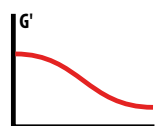
Viscous Torque



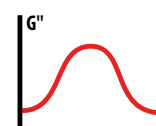
Complex Torque



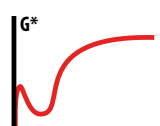
Loss Factor



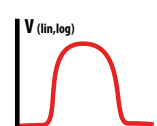
Storage Shear Modulus



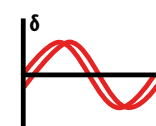
Loss Shear Modulus



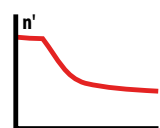
Complex Shear Modulus



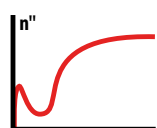
Vulcanization speed



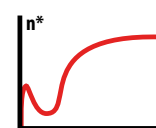
Loss Angle



Real Dynamic Viscosity



Imaginary Dynamic Viscosity



Dynamic Complex Viscosity

Technical specification

| | |
|----------------------------|--|
| International standards | ISO 6502, ASTM D 5289, ASTM D 6204, ASTM D 6601, DIN 53529 |
| Test chamber | Biconical, closed System |
| Die gap | 0,45 mm nominal |
| Force measurement | Torque transducer mounted at the upper test chamber Pressure measurement optional |
| Closing system | Soft closing to prevent foil rips and damage of test samples |
| Oscillation frequency | 0,001 Hz to 33 Hz |
| Oscillation amplitude | 0,01° to 20° |
| Torque range | 0,01 to 225 dNm |
| Sample volume | approx. 4,5 cm ³ |
| Temperature control system | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled (Pneumatic double channel cooling system standard) |
| Temperature check system | Recordings of the temperature gradient on the screen, microprocessor monitored |
| Units | Torque (dNm, lbf.in, kgf.cm), Shear modulus (Pa, dynes/cm ² , psi) Dynamic viscosity (Pa s), Temperature (°C, °F) Pressure (bar, kg per cm ²), Time (min - min / min - sec) Frequency (Hz, cpm), Shear rate (1/s, rad/s) |
| Subroutines | Amplitude Sweep, Frequency Sweep, Temperature Sweep, Shear rate Sweep, Relaxation, Retardation, Hysteresis, Tension tests, ... |
| Pneumatics | min 5 Bar |
| Electrical | Single phase 220 V - 230 V, 8 Amps |

Rugged solid metal case, heavy-duty type

Connection possibility for suction (ø 100 mm)

Net weight approx. 230 kg



D-MDR 3000

Dynamic Moving Die Rheometer



► The D-MDR 3000

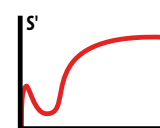
is designed for measuring the viscoelastic properties of polymers and elastomeric compounds before, during and after cure. The acquired data is giving exact information about the processability, the cure characteristics, the cure speed, as well as the behaviour of the compound at the after-cure.

► The D-MDR 3000 fulfils the complete range of all test requirements: Polymer or raw materials as well as basic, finished and cured compounds can be characterized. Besides the cure properties the cure characteristic and the processability can be determined and evaluated.

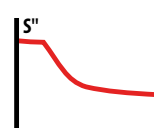
► Due to the rugged and flexible construction of the D-MDR 3000 this device can be used for extended quality controls purposes not only in the laboratory, but also directly in the production area.

► The high flexibility of the D-MDR 3000 allows the user to program and execute arbitrary test sequences with the MonControl Analyses Software. Isothermal tests, non-isothermal tests, amplitude sweeps, frequency sweeps, temperature sweeps, shear rate sweeps, relaxations, retardations, hysteresis and tension tests can be defined and executed, as well as any combination of each sequences.

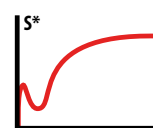
► Determinable measurements



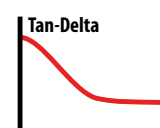
Elastic Torque



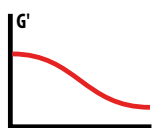
Viscous Torque



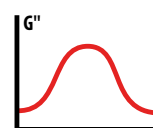
Complex Torque



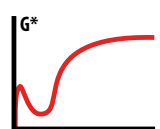
Loss Factor



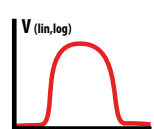
Storage Shear Modulus



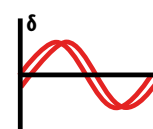
Loss Shear Modulus



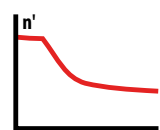
Complex Shear Modulus



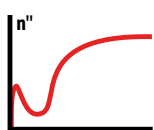
Vulcanization speed



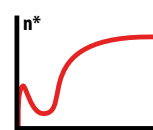
Loss Angle



Real Dynamic Viscosity



Imaginary Dynamic Viscosity



Dynamic Complex Viscosity

► Technical specification

| | |
|---|--|
| International standards | ISO 6502, ASTM D 5289, ASTM D 6204, ASTM D 6601, DIN 53529 |
| Test chamber | Biconical, closed System |
| Die gap | 0,45 mm nominal |
| Force measurement | Torque transducer mounted at the upper test chamber Pressure measurement optional |
| Closing system | Soft closing to prevent foil rips and damage of test samples |
| Oscillation frequency | 0,001 Hz to 100 Hz |
| Oscillation amplitude | 0,001° to 180° |
| Torque range | 0,001 to 235 dNm |
| Sample volume | approx. 4,5 cm ³ |
| Temperature control system | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled (Pneumatic double channel cooling system standard, low-temperature cooling systems (+10 / -40°C) optional) |
| Temperature check system | Recordings of the temperature gradient on the screen, microprocessor monitored |
| Units | Torque (dNm, lbf.in, kgf.cm), Shear modulus (Pa, dynes/cm ² , psi) Dynamic viscosity (Pa s), Temperature (°C, °F) Pressure (bar, kg per cm ²), Time (min - min / min - sec) Frequency (Hz, cpm), Shear rate (1/s, rad/s) |
| Subroutines | Amplitude Sweep, Frequency Sweep, Temperature Sweep, Shear rate Sweep, Relaxation, Retardation, Hysteresis, Tension tests, ... |
| Pneumatics | min 5 Bar |
| Electrical | Single phase 220 V - 230 V, 8 Amps |
| Rugged solid metal case, heavy-duty type | |
| Connection possibility for suction (ø 100 mm) | |
| Net weight approx. 230 kg | |



D-RPA 3000

Dynamic Rubber Process Analyser

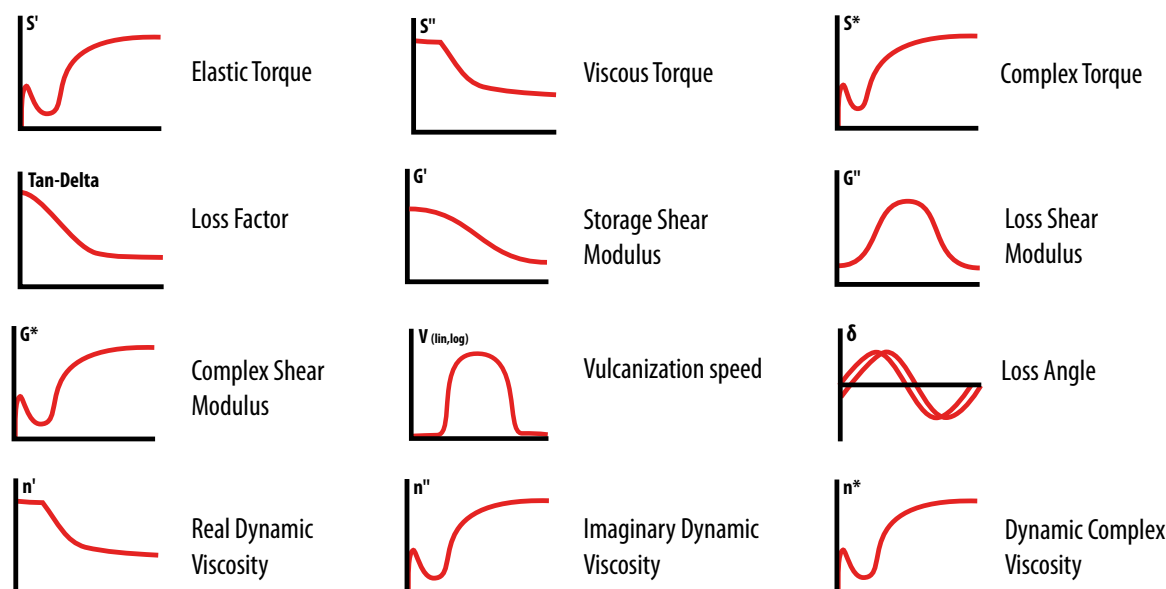


► The D-RPA 3000

- is designed for measuring the viscoelastic properties of polymers and elastomeric compounds before, during and after cure. The acquired data is giving exact information about the processability, the cure characteristics, the cure speed, as well as the behaviour of the compound at the after-cure.
- The D-RPA 3000 fulfils the complete range of all test requirements: Polymer or raw materials as well as basic, finished and cured compounds can be characterized. Besides the cure properties the cure characteristic and the processability can be determined and evaluated.
- The D-RPA 3000 is the state of the art machine for dynamic testing purposes: Therefore the machine can be fitted with several unique options such as variable die gap, low-temperature cooling, high speed data acquisition ...

- The high flexibility of the D-RPA 3000 allows the user to program and execute arbitrary test sequences with the MonControl Analyses Software. Isothermal tests, non-isothermal tests, amplitude sweeps, frequency sweeps, temperature sweeps, shear rate sweeps, relaxations, retardations, hysteresis and tension tests can be defined and executed, as well as any combination of each sequences.

► Determinable measurements



► Technical specification

| | |
|----------------------------|--|
| International standards | ISO 6502, ASTM D 5289, ASTM D 6204, ASTM D 6601, DIN 53529 |
| Test chamber | Biconical, closed System |
| Die gap | 0,45 mm nominal, variable die gap and closing force optional |
| Force measurement | Torque transducer mounted at the upper test chamber Pressure measurement optional |
| Closing system | Soft closing to prevent foil rips and damage of test samples, optionally variable closing force |
| Oscillation frequency | 0,001 Hz to 100 Hz |
| Oscillation amplitude | 0,0001° to 180° |
| Torque range | 0,0001 to 235 dNm |
| Sample volume | approx. 4,5 cm ³ |
| Temperature control system | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled (Pneumatic double channel cooling system standard, low-temperature cooling systems (+10 / -40°C) optional) |
| Temperature check system | Recordings of the temperature gradient on the screen, microprocessor monitored |
| Units | Torque (dNm, lbf.in, kgf.cm), Shear modulus (Pa, dynes/cm ² , psi) Dynamic viscosity (Pa s), Temperature (°C, °F) Pressure (bar, kg per cm ²), Time (min - min / min - sec) Frequency (Hz, cpm), Shear rate (1/s, rad/s) |
| Subroutines | Amplitude Sweep, Frequency Sweep, Temperature Sweep, Shear rate Sweep, Relaxation, Retardation, Hysteresis, Tension tests, ... |
| Pneumatics | min 5 Bar |
| Electrical | Single phase 220 V - 230 V, 8 Amps |

Rugged solid metal case, heavy-duty type

Connection possibility for suction (ø 100 mm)

Net weight approx. 230 kg

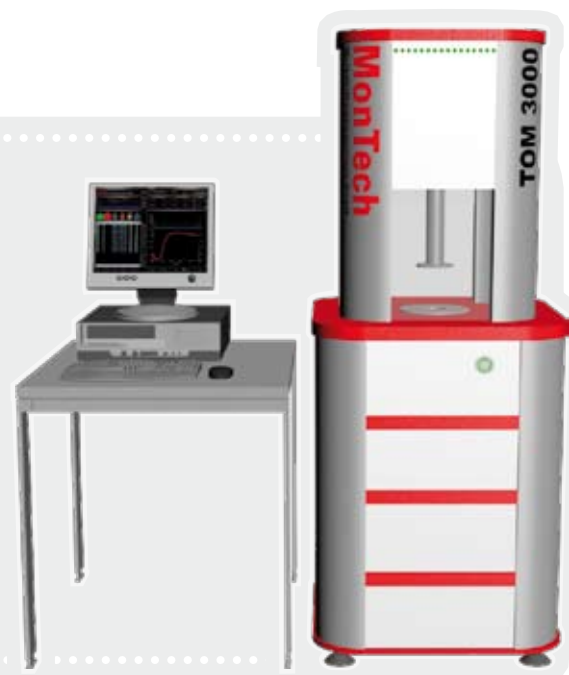


TOM 3000 Ozon

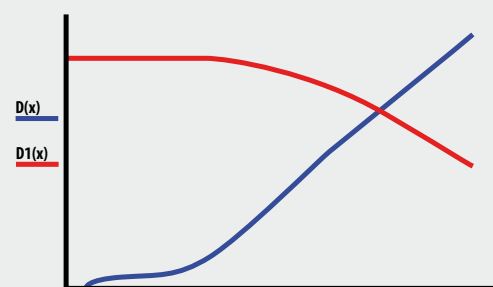
Automated testing system for the dynamic ozone resistance of rubber

TOM 3000

- the instrument is used for the fast determination of the ozone resistance of rubber under dynamic load conditions.
- The test sequence runs fully automated including application of pressure loads, relaxation and ozoning until total destruction of the sample.
- A single test only takes about 15 to 20 Minutes.

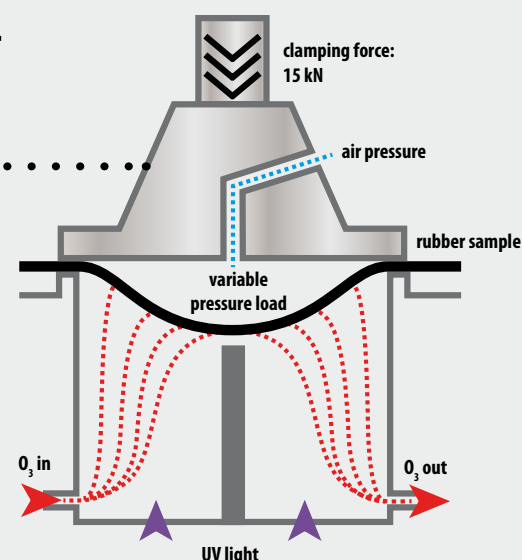


Influence of absorbed ozone



Sample Stress ($D1(x)$) vs.
quantity of absorbed ozone ($D(x)$)

Test chamber



Overview Mooney Viscometer



PERFORMANCE

MV 3000 Basic

V-MV 3000

Technical specification

| | MV 3000 Basic | V-MV 3000 |
|----------------------------|--|--|
| International standards | ISO 289:2005, ASTM D 1646, DIN 53523 | ISO 289:2005, ASTM D 1646, DIN 53523 |
| Test chamber | According to international standards | According to international standards |
| Rotor speed | 2 turns per minute | 0 to 50 turns per minute, 0.01 steps |
| Relaxation | According to ISO 289:2005, DIN 53523 Part 4 | According to ISO 289:2005, DIN 53523 Part 4 |
| Temperature control system | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled |
| Temperature check system | Recordings of the temperature gradient on the screen, microprocessor monitored | Recordings of the temperature gradient on the screen, microprocessor monitored |
| Units | Mooney - units, Temperature (°C, °F), Time (min - min / min - sec) | Mooney - units, Temperature (°C, °F), Time (min - min / min - sec) |

(See page 18)

(See page 20)



MV 3000 Basic

Mooney Viscometer

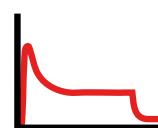


The MV 3000 Basic

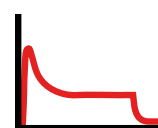
is a rotational shear viscometer according to Mooney and is used for the determination of the viscosity of polymers and for determination of the vulcanisation behaviour of rubber at a fixed rotor speed and a predefined temperature.

- The testing instrument consists of the machine case, a PC with screen, keyboard and mouse as well as a printer.
- The data acquisition and the controlling of the testing instrument is made by the PC by means of the MonControl analysis software. For the storage and analysis of the determined measurement data a modern SQL database structure is provided.
- For the exact production of test samples for the MV 3000 Basic the M-VS 3000 sample cutter for Mooney is optional available. The usage of a volume cutter is recommended - this ensures reliable and reproducible test results.

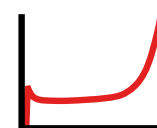
Determinable results



Mooney viscosity



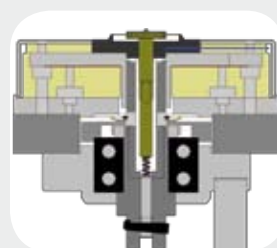
Stress relaxation



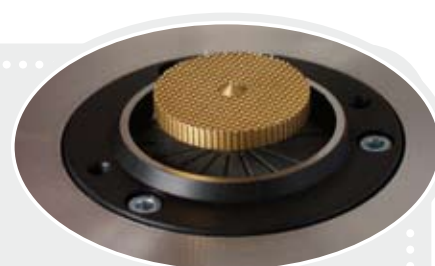
Mooney scorch

Test chamber system

- The torque is created by a replaceable rotor which is completely embedded in the test material in a closed test chamber.

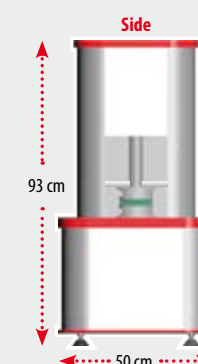
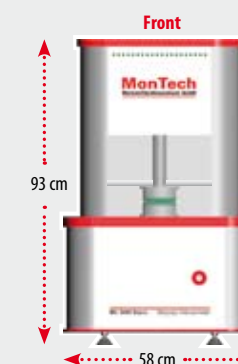


- The rotational movement is created by a geared motor with a fixed speed of 2 turns per minute.



Technical specification

| | |
|----------------------------|--|
| International standards | ISO 289:2005, ASTM D 1646, DIN 53523 |
| Test chamber | According to international standards |
| Force measurement | Torque transducer |
| Closing force | 11,5 kN |
| Rotor speed | 2 turns per minute |
| Relaxation | According to ISO, DIN 289 Part 4 |
| Torque range | 0,01 to 200 MU |
| Sample volume | approx. 4,5 cm ³ |
| Temperature control system | Room temperature to 230 °C, precision +/- 0.03 °C, microprocessor controlled |
| Temperature check system | Recordings of the temperature gradient on the screen, microprocessor monitored |
| Units | Mooney - units, Temperature (°C, °F) Time (min - min / min - sec) |
| Pneumatics | min. 5 Bar |
| Electrical | Single phase 220 V - 230 V, 5 Amps |



Rugged solid metal case, heavy-duty type

Connection possibility for suction (Ø 100 mm)

Net weight approx. 130 kg



V-MV 3000

Variable Mooney Viscometer



► The Variable Mooney Viscometer V-MV 3000

is used for the determination of the viscosity of polymers and for determination of the vulcanisation behaviour of rubber at different shear rates and temperatures.

- The instrument is directly controlled by the PC.
- The torque measurement is performed by a high resolution torque transducer.

► Determinable results



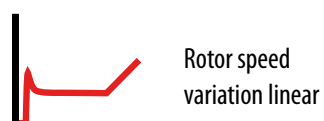
Mooney viscosity



Mooney scorch



Stress relaxation



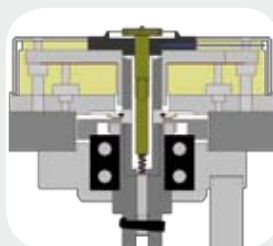
Rotor speed variation linear



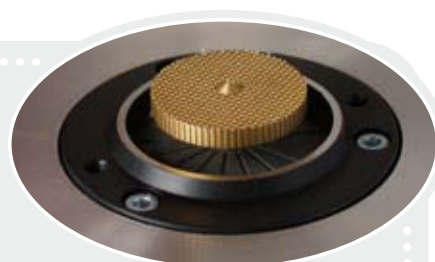
Rotor speed variation steps

► Test chamber system

- The torque is created by a direct driven, replaceable rotor which is completely embedded in the test material in a closed test chamber.

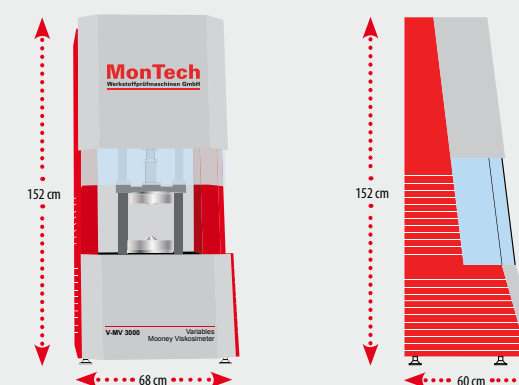


- The rotational movement is created by a servo-motor with an adjustable speed from 0 to 50 turns per minute. The rotor movement along with the temperature of the dies can be directly controlled via MonControl software - therefore unlimited number of sub-steps or speed sections per single test can be programmed.



► Technical specification

| | |
|----------------------------|---|
| International standards | ISO 289:2005 / ASTM D 1646, DIN 53523 |
| Test chamber | According to international standards |
| Force measurement | Torque transducer |
| Closing force | 11,5 kN |
| Rotor speed | 0 to 50 turns per minute, 0,01 steps |
| Relaxation | According to ISO, DIN 289 Part 4 |
| Torque range | 0,001 to 200 MU |
| Temperature system | Room temperature to 230 °C, precision +/- 0.03 °C microprocessor controlled |
| Temperature control system | Recording of the temperature on the screen, microprocessor - controlled |
| Units | Mooney - value, Temperature (°C, °F), Time (Min - Min / Min - Sec) |
| Pneumatics | min. 4,5 Bar |
| Electrical | Single phase, 220 - 230 Volt |



Robust solid metal body, heavy-duty type

Connection possibility for suction (Ø 100 mm)

Net weight approx. 220 kg



Overview of instruments for

sample preparation

Volume and sample cutters



PERFORMANCE

R-VS 3000

M-VS 3000

P-VS 3000

Technical specification

| | R-VS 3000 | M-VS 3000 | P-VS 3000 |
|----------------------------|--|---|---------------------------------------|
| Cutting - diameter | 35 mm (volume controlled cut) | 45 mm (volume controlled cut) | All ISO, DIN and ASTM - types |
| Max. thickness | 12 mm | 15 mm | 6 mm |
| Reproducibility | 0,1 % | 0,1 % | 0,1 % |
| Sample-volume (adjustable) | 2 cm ³ to 8 cm ³ | 2 cm ³ to 18 cm ³ | Differs to the cutting knife geometry |
| Compression - time | 1 sec to 15 sec | 1 sec to 15 sec | — |
| Dimensions (H x W x D) | 600 mm x 430 mm x 380 mm | 600 mm x 430 mm x 380 mm | 450 mm x 300 mm x 250 mm |
| Weight | 50 kg | 50 kg | 30 kg |
| Pneumatics | min 5,5 Bar | min 5,5 Bar | min 5,5 Bar |

• (See page 24)

• (See page 25)

• (See page 26)

LP 3000 Laboratory press series

Technical specification

| Lab Press Series | P80 | H200 | H400 | H800 |
|--|------------|------------|------------|------------|
| Type | Pneumatic | Hydraulic | Hydraulic | Hydraulic |
| Closing Force kN | 80 | 200 | 400 | 800 |
| Platen size mm | 150 x 120 | 210 x 210 | 310 x 310 | 410 x 410 |
| Cylinder stroke mm | 150 | 200 | 200 | 200 |
| Specific platen pressure N/mm ² | 4.44 | 4.53 | 4.16 | 4.76 |
| Heating type | electrical | electrical | electrical | electrical |
| Capacity per platen kW | 2.2 | 2.8 | 3.4 | 4.0 |
| Max. temperature °C | 260 | 260 | 260 | 260 |
| Temp accuracy °C | +/- 1.0 | +/- 1.0 | +/- 1.0 | +/- 1.0 |
| Accessories / Options | | | | |
| 2-Hand safety control | S | — | — | — |
| Pneumatic front shield | — | S | S | S |
| Temperature accuracy +/- 0.5°C | 0 | 0 | 0 | 0 |
| Single temperature controllers per heating plate | S | S | S | S |
| PLC controlled Device with press - step Programming and software | — | 0 | 0 | 0 |
| Digital pressure adjustment and controller (High precision adjustment) | — | 0 | 0 | 0 |
| enlarged cylinder strokes | — | 0 | 0 | 0 |
| enlarged heating plate 310x310mm | — | 0 | — | 0 |
| enlarged heating plate 510x510mm | — | — | 0 | 0 |
| Removable middle heating plate | — | 0 | 0 | 0 |

— = not available S = Standard 0 = Option



R-VS 3000

Rheometer - volume sample cutter



The Rheometer volume cutter

serves fast and exact production of test samples for the Rheometer measurement. Especially for rotorless systems.

This volume cutter works with a double working pneumatic cylinder system. This always ensures an equal volume of the test samples. The volume adjustment is made very simple by the adjusting ring underneath the stamp.

For safe operation the volume cutter is equipped with a two-hand safety operation system.

Technical specification

| | |
|---------------------------------|--|
| Cutting - diameter | 35 mm |
| Max. thickness | 12 mm |
| Reproducibility | 0,1 % |
| Sample-volume (adjustable) | 2 cm ³ to 8 cm ³ |
| Compression - time (adjustable) | 1 sec to 15 sec |
| Dimensions (H x W x D) | 600 mm x 430 mm x 380 mm |
| Weight | 50 kg |
| Pneumatics | min 5,5 Bar |



M-VS 3000

Mooney volume sample cutter



The Mooney volume cutter

serves fast and exact production of test samples for the Mooney measurement. A center hole for the rotor shaft is punched out within the cutting sequence.

This volume cutter works with a double working pneumatic cylinder system. This always ensures an equal test sample volume. The volume adjustment is made very simply by the adjusting ring underneath the stamp.

For safe operation the volume cutter is equipped with a two hand safety operation system.

Technical specification

| | |
|---------------------------------|---|
| Cutting - diameter | 45 mm |
| Max. thickness | 15 mm |
| Reproducibility | 0,1 % |
| Sample-volume (adjustable) | 2 cm ³ to 18 cm ³ |
| Compression - time (adjustable) | 1 sec to 15 sec |
| Dimensions (H x W x D) | 600 mm x 430 mm x 380 mm |
| Weight | 50 kg |
| Pneumatics | min 5,5 Bar |



P-VS 3000

Universal sample cutters



► Universal sample cutter

for a fast and exact preparation of sample test specimens for tensile tests as well as all other standard sample shapes according to DIN, ISO and ASTM.

► The machine cuts the exact shape of the test samples.

► For safe operation the volume - cutter is equipped with a two-hand safety operation system.

► All cutters for the production of test samples for tensile tests and other specimen geometries can be inserted into the sample cutter.



► Technical specification

| | |
|------------------------|---------------------------------------|
| Cutters | All ISO, DIN and ASTM - types |
| Max. sample thickness | 6 mm |
| Reproducibility | 0,1 % |
| Sample volume | Differs to the cutting knife geometry |
| Dimensions (H x W x D) | 450 mm x 300 mm x 250 mm |
| Weight | 30 kg |
| Pneumatics | min 5,5 Bar |



CP 3000

Laboratory bale cutter



► The laboratory bale cutter CP 3000

was developed for sample preparation in the laboratory environment, and serves particular for the production of cuts of rubber or polymer bales.

► The bale is placed on the conveyor at the backside of the machine and desired portion / cut size is pushed into the ball cutter. The cutting blade is guided by hardened, precision grinded ball bearing guides. This ensures a smooth movement of the blade and precise cuts.

► The CP 3000 is fully pneumatic operated and does not require any electrical connection - this means only a minimum energy is consumed, low noise during Standby and cutting as well as a very easy maintenance.

► Technical specification

| | |
|------------------------------|---|
| Strokes | Up to 12 cuts / minute, cutting and lifting speed adjustable |
| Bale Length / width of cut | max. 520 mm |
| Bale height / average height | max. 240 mm |
| Cutting pressure | Controllable via the included gauge unit Minimum cutting force: 0.6 tonnes at 2.0 bar input pressure Maximum cutting force: 4.6 tonnes at 10.0 bar input pressure |
| Cutting knife | hardened and precision grinded |
| Cutting strip | Teflon, exchangeable |
| Material supply | roller conveyor, total length 750 mm |
| Safety equipment | pneumatic safety 2-hand operation, transparent safety sheild at both sides, the front and the back of the machine |
| Required supplies | Compressed air, there is no need for electrical connection! |
| Weight | 280 kg Gross / 225 kg Net |



H&D 3000

Hardness & Density Testing Instrument

Fully automatic testing instrument for measurements of the shore hardness and density of rubber compounds.

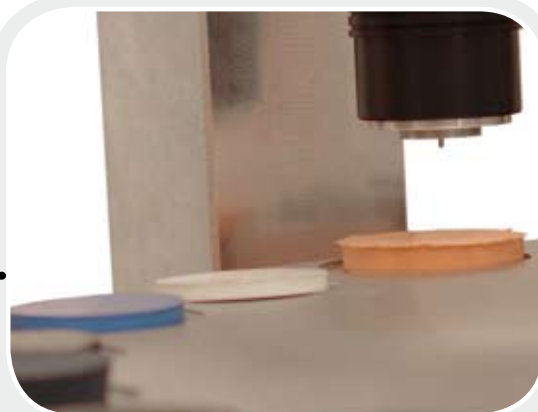


- ▶ Two possible operation modes: Endless or magazine change.
- ▶ Evaluation and visualization of the test results by the MonDevice software system.

▶ Measuring head

for the determination of the hardness according to shore A, D or optional IRHD.

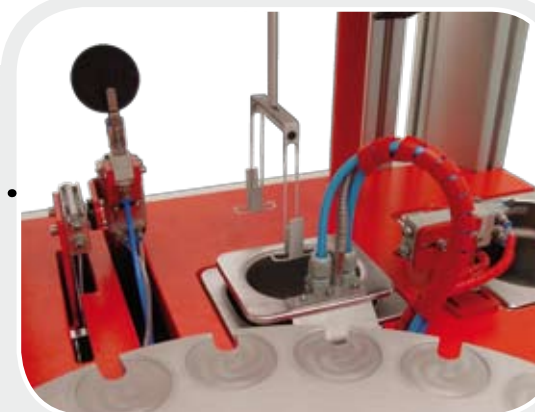
- ▶ Changeable plate magazine with 20 test samples.



▶ Hygrostatic weighing

for the exact determination of the density on two separate weighing stations.

- ▶ High-precision weighing system with fully automatic tare and calibration.



▶ Integrated pumping circuits

to fill and empty in the basin.

- ▶ Optional available:
 - Automatic change of plate magazines
 - Separation of failed / passed samples in different containers.





RD 3000

Density Tester for uncured rubber compounds

Automatic compression density tester for uncured rubber compounds and polymers.



The RD 3000

is used to determine the density of uncured rubber compounds. Therefore uncured rubber samples with no specific sample preparation can be used. This can also be simple rubber cuts from the production process.

For automatic acquisition and processing of all test related data, the RD 3000 is equipped with:

- an electronic precision scale
- an electronic piston measurement device
- a external or integrated computer system
- MonDevice Software

Measurement sequence

① Weighing

The sample is placed on the electronic balance which is integrated into the machine table. Therefore only stable weight readings will be accepted.

② Compression of the sample

The sample material is filled into the barrel and the compression of the material is started. When the piston finally reaches a stable position in the compression process, all air is removed from the sample which means that now the test sample is compressed to its specific volume.

③ Volume determination

To sample volume is determined by calculation of the difference between the piston stroke at an empty barrel and the current barrel position with the specific test material.

④ Density calculation

From the weight and the determined volume the density of the sample is calculated automatically.

⑤ Displaying of test results

The calculated sample density is along with all further results for the test sequence displayed in the MonDevice software.

Technical specification

| | | |
|--------------------------|---|------------------------------|
| Density | Density range: | 0,8 - 2,6 g/cm ³ |
| | Accuracy: | 0,1 % |
| | Reproducibility: | 0,03 % |
| Sample volume | Required sample volume: | 40 - 120 cm ³ |
| | Recommended sample volume: | about 100 cm ³ |
| Integrated scale | Sample weight range: | 0 - 320 g |
| | Resolution: | 1 mg |
| Compression cylinder | Diameter: | 60 mm |
| | max. Deflection: | 80 mm |
| Pneumatics | Supply: | 5,5 - 10 bar |
| | Pressure range for compression: | 4,5 - 5,5 bar |
| | Compression force: | 40,0 kN (at 5 bar) |
| | Volume of air / cycle: | 64 l (= 64 dm ³) |
| Interfaces | Ethernet Network (10/100 MBit), MonDevice Software included | |
| Power supply | 1 * 230 V, 50/60 Hz + N + PE | |
| | Power Consumption: | about 1 A |
| Dimensions | Height: | 1085 mm |
| | Width: | 525 mm |
| | Depth: | 645 mm |
| Weight | about 190 kg | |
| Environmental conditions | Storage: | |
| | Temperature | - 25°C - + 55°C |
| | relative humidity | 5 - 95 % |
| | Operation: | |
| | Temperature | + 5°C - + 45°C |
| | relative humidity | 5 - 95 % |



DisperTester 3000

Carbon black dispersion tester



DisperTester 3000

- Allows quick and easy testing of dispersion compared to other optical techniques which often take hours to perform (less than 2 minutes with sample preparation).
- Provides accurate, repeatable results in seconds for both vulcanised and uncured rubber compounds that are applicable to the process.
- Uses digital image processing to automatically determine dispersion ratings, filler distribution and agglomerate size.
- Can be used for all filler types including Carbon Black, Silica and natural inorganic materials.
- The determination of filler dispersion in technical rubber goods and tire compounds is of great importance to the industry. Dispersion quality has a direct impact on final product properties and is therefore widely used as a quality control parameter.
- The DisperTester 3000 is a state of the art instrument designed to measure filler dispersion in rubber compounds. Many properties of the cured compound are directly affected by filler dispersion including:
 - Tensile strength
 - Tear strength
 - Fatigue resistance
 - Abrasion resistance
- The DisperTester 3000 is the only instrument that gives a direct measurement of dispersion in a fast and simple test, without requiring subjective assessment.

Technical specification

| | |
|-------------------------|--|
| International standards | ISO 11345 : 2006 |
| Electrical Requirements | 80 - 250 VAC, 47 - 63 Hz, 1 Amps |
| Dimensions | Height: 185 mm Width: 160 mm Depth: 525 mm |
| Weight | 17,5 kg (net) |
| Magnification | DisperTester 3000 - 1000x = 1000 times magnification DisperTester 3000 - 100x = 100 times magnification DisperTester 3000 - 30x = 30 times magnification |
| System requirements | IBM Compatible PC with Windows 2000 / XP / Vista / 7. Computer, TFT Screen. Keyboard, Mouse, Printer and connection cables are supplied with the DisperTester 3000. |
| Aperture Size | DisperTester 3000 - 1000x = 4 mm x 3.5 mm DisperTester 3000 - 100x = 4 mm x 3.5 mm DisperTester 3000 - 30x = 9 mm x 5 mm |

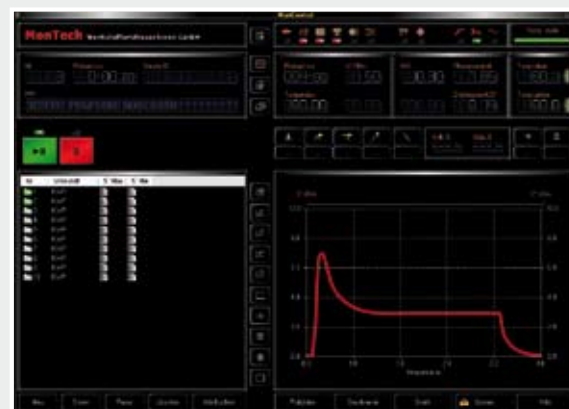




MonControl

Analyses Software

▶ The following kinds of rubber test instruments are currently supported by MonControl:



- Abrasion testers
- Balances / Scales
- Density testers
- Flexometers
- Hardness testers
- Mooneys
- Processability testers
- Rebound testers
- Rheometers
- Tensile testers

▶ MonControl offers an unique user interface for the operation of any rubber testing instrument.

▶ There are more than 5000 available test features, which can be applied to every test.



▶ The MonControl analyses software uses an universal database connection via ODBC which ensures a compatibility to all common database systems.

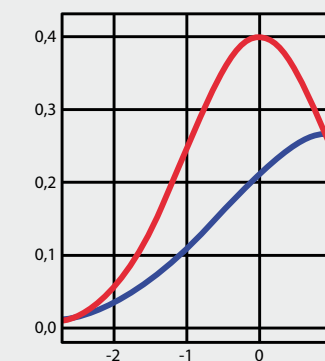
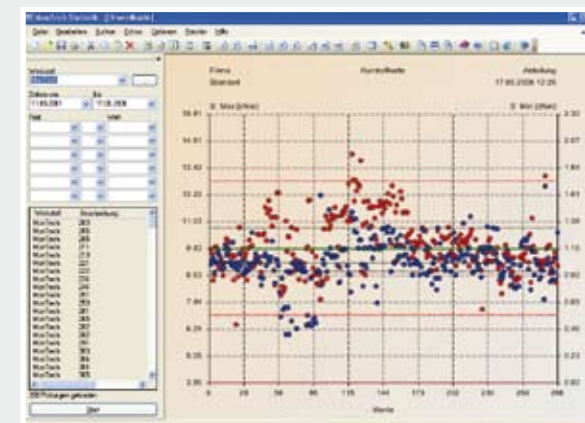
▶ Because of the network ability of the MonControl analyses software it can simply and fast be tied into the available central data structure of your company.



Software systems

MonStat

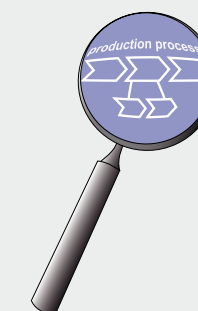
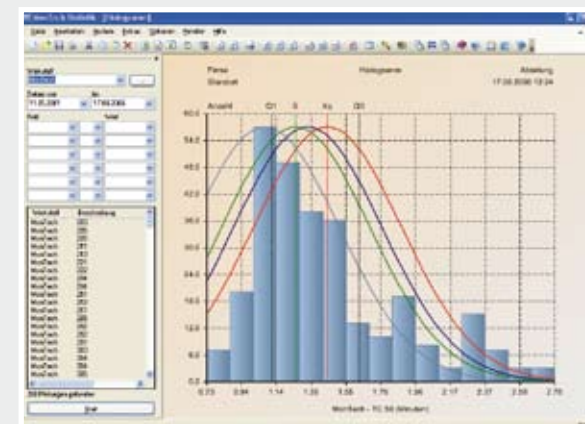
▶ SPC and result monitoring



SPC and result monitoring

▶ Software for statistical evaluation and valuation of the gained measurements.

▶ Production process monitoring



Production process monitoring

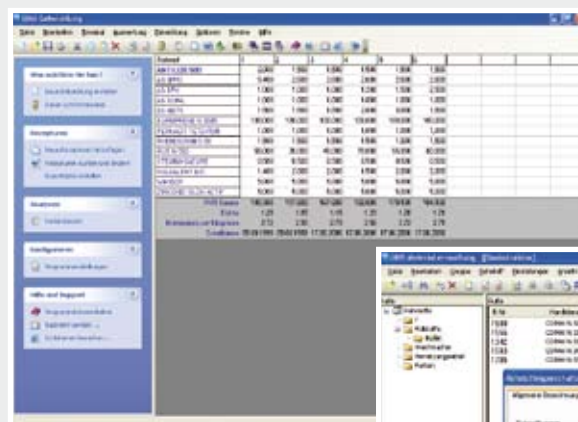
▶ Analyze the reliability and the consistency of the manufacturing process to produce high quality products.



Software systems

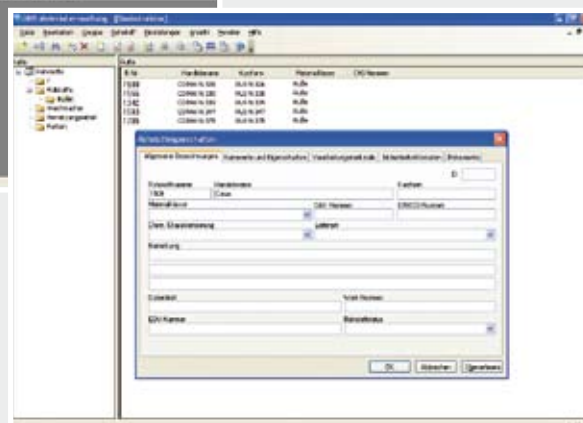
MonRecipe & MonQuality

MonRecipe - Recipe development

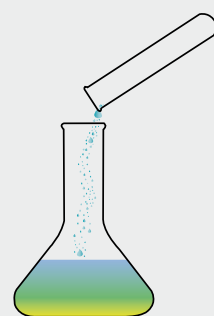
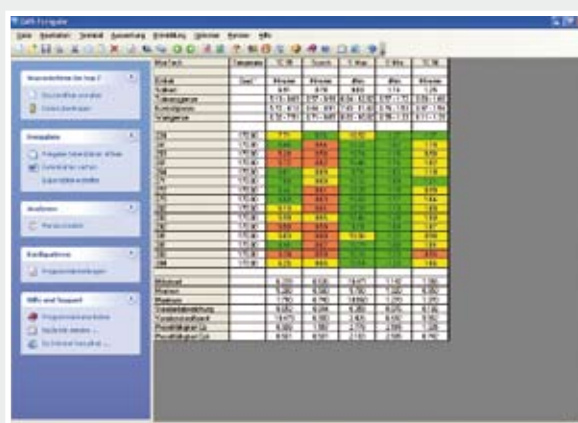


recipe development

- Software for the optimization of the recipe management.
- Simplifies work processes and increases the quality standard.



MonQuality - Lab information management systems



Lab information management systems

- A laboratory information system manages and analyses the measurements.
- Controls the batch release.

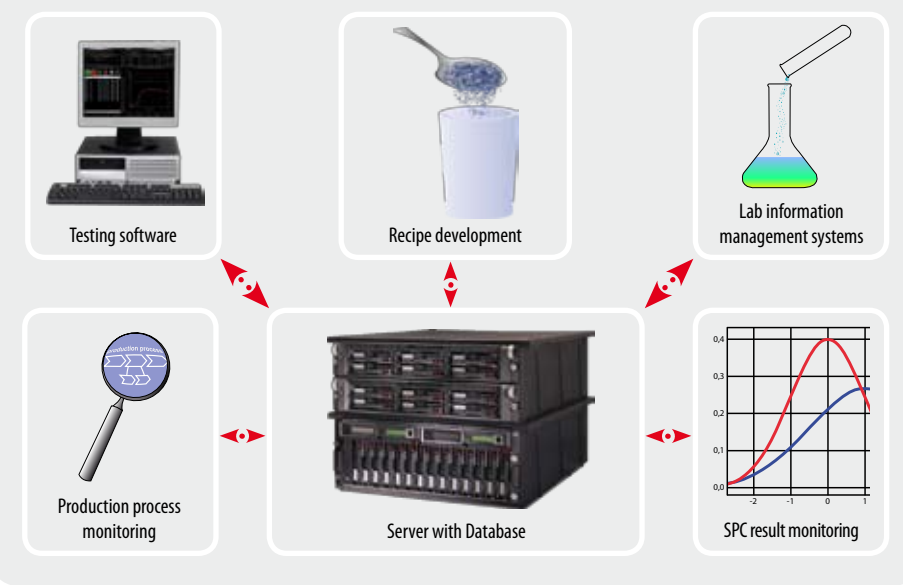


Software systems

Networking

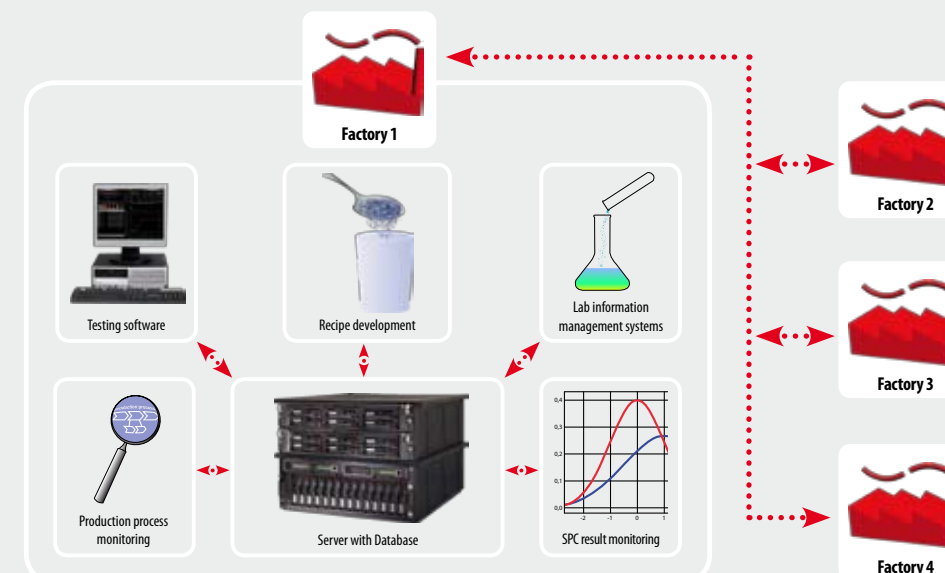
Local networking

- With a common database for the software used for the development and for the production it would be possible to offer constant quality standards and to carry out adequate quality assurance measure.



Global networking

- Global networking expands the concept of the local networking to all factories. Therefore all locations benefit from the advantages of a networked development and production.





Service and Calibration

Service, maintenance, calibration

- Service, maintenance, calibration for all available testing instruments.
- Our service technicians will help you quickly and easily.
- Availability: 24 hours a day, 365 days a year - worldwide



Modernization



- Complete overhauling and repair of your testing instruments at our factory.
- For all available testing instruments.

Spare parts und special foil

- Spare parts for all available testing instruments.
- Special foil for Rheometer and Mooney testing.



About us

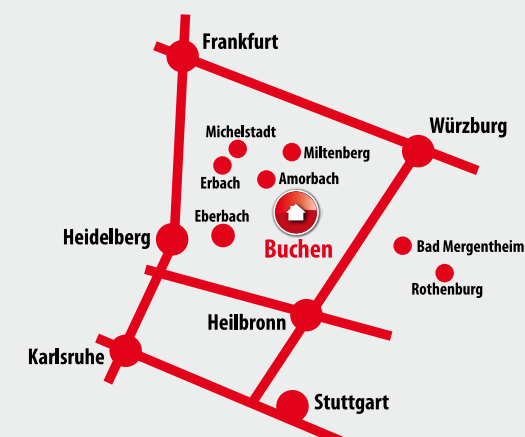
More informations you can find online at www.rubber-testing.com

MonTech Werkstoffprüfmaschinen GmbH

We are manufacturer of testing instruments for the caoutchouc, rubber and elastomer industry and offer service, maintenance and calibration as well as all required spare parts for this.

Next to this line of business we design, develop and manufacture electronics and control systems for various industries and applications. All activities from the construction about the control programming up to the assembly become accomplished in our factory by qualified employees.

For this, it was mandatory to document and audit our abilities and procedures in a quality management system according to DIN EN ISO 9001:2000. Furthermore the accreditation as an official calibration laboratory according to DIN EN ISO 17025:2005 was awarded to us.



MonTech
Werkstoffprüfmaschinen GmbH
Carl - Benz - Straße 11
D - 74722 Buchen / Germany

MonTech

Werkstoffprüfmaschinen GmbH

MonTech

Werkstoffprüfmaschinen GmbH

Carl-Benz-Straße 11

D-74722 Buchen / Germany



**QUALITÄTS-
MANAGEMENT**

Wir sind zertifiziert

Regelmäßige freiwillige
Überwachung nach ISO 9001:2000



Senselektro Kft.
1064 Budapest
Vörösmarty u. 33.
www.senselektro.hu
senselektro@senselektro.hu

Copyright - MonTech Werkstoffprüfmaschinen GmbH - All rights reserved - Printed in Germany

www.senselektro.hu - senselektro@senselektro.hu