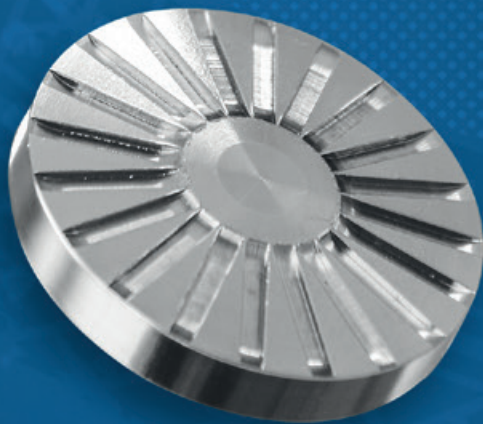


bareiss®

OSCILLATE.
ROTATE.
SIMULATE



BAREISS RHEOLOGY





Instrument status
indicator lights



High sampling rate for
improved FT-Rheology



Adjustable
sealing
pressure

Dual testing modes:



Rotation



Oscillation

Expansive viewing window
and ergonomic workplace



Extrusion-relevant
(steady) shear rates possible
(up to 500 s^{-1})



REVOLUTIONIZING ELASTOMER ANALYSIS

The Bareiss RPA marks a significant leap forward in the analysis of rubber and elastomer materials. Innovatively engineered to tackle the rubber industry's unique needs, this pioneering Rubber Rheometer solution stands out with its fully rotating lower die. It is an essential tool for researchers, quality control specialists, and production managers who are at the forefront of elastomer innovation and process optimization.

RPA *Ultra*



Complete testing
capabilities in a single,
powerful instrument

RPA *select*



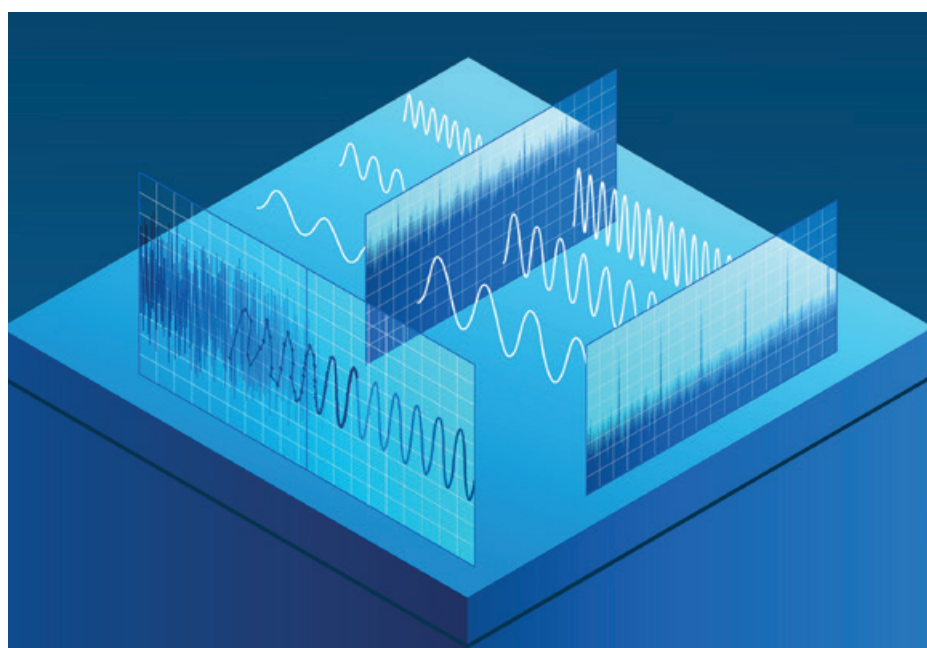
Start with essential testing,
upgrade as your needs evolve



KEY FEATURES

Fully rotational lower die for process relevant simulation

Experience testing that mirrors reality. Designed for extrusion-relevant shear rates, the Bareiss RPA simulates actual processing conditions, bridging the gap between lab results and production outcomes.



High sampling rate for improved Fourier Transform (FT) Rheology

With an astounding high-sampling rate captured per cycle, the Bareiss RPA doesn't just analyze - it dissects material behavior with surgical precision. This, in turn, improves Fourier Transform Rheology (FTR) by converting time-domain data into frequency-domain information for a comprehensive analysis of viscoelastic material properties.



Production-Level Insights with Wall-Slip Analysis

By replacing the standard upper test die with a polished die set that mirrors extruder wall surface roughness, the Bareiss RPA enables precise simulation of actual production conditions. This wall-slip measurement capability allows researchers to investigate material behavior more accurately.



Compatible with BareissOne – the software platform for your measurement data

Intuitive software simplifies complex testing procedures, allowing researchers to focus on analysis rather than instrument operation. Streamline your workflow and increase productivity.

World's first floor standing model

Say goodbye to stationary limitations. As the world's first floor-standing model with built-in rollers, the Bareiss RPA brings flexibility to your fingertips. Effortlessly glide it across your lab or to different testing sites.



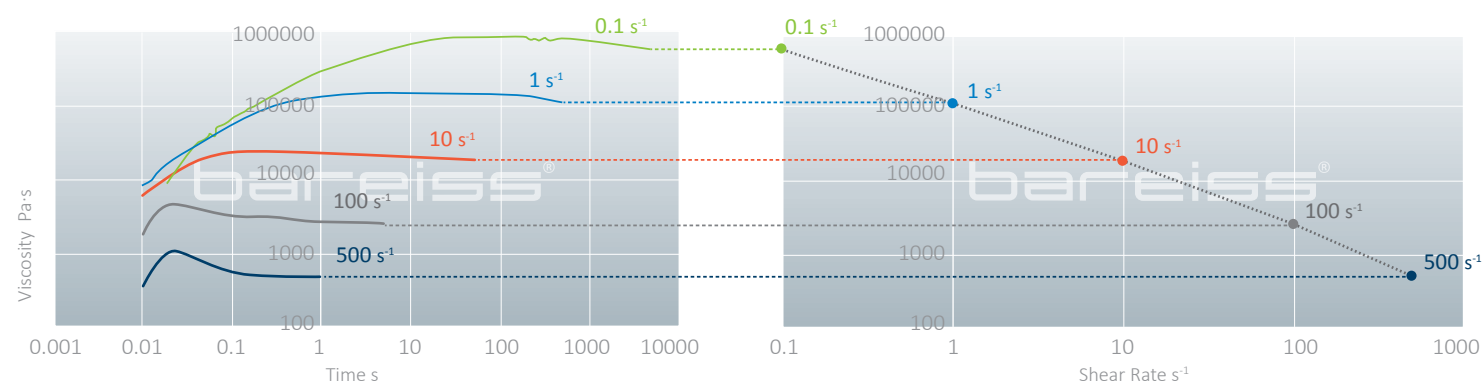


MEASURING METHODS AND THEIR APPLICATION.

Steady Shear Viscosity

To better understand the **manufacturing process** of an unvulcanized rubber compound, the steady shear viscosity is one of the most important properties, especially crucial for determining the process parameters for extrusion and injection molding purposes.

The Bareiss RPA's rotating lower die with unlimited strain thus provides the user with a dual test mode: dynamic and steady shear.



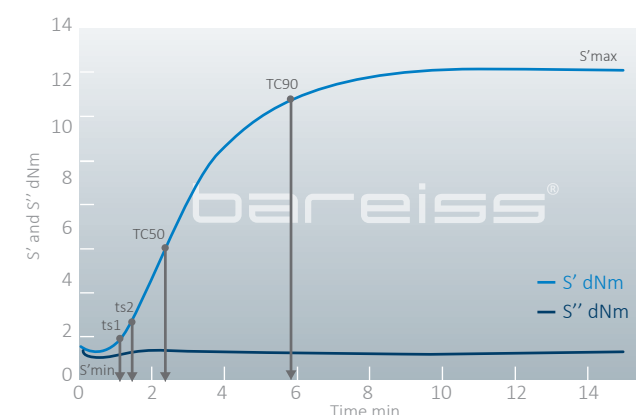
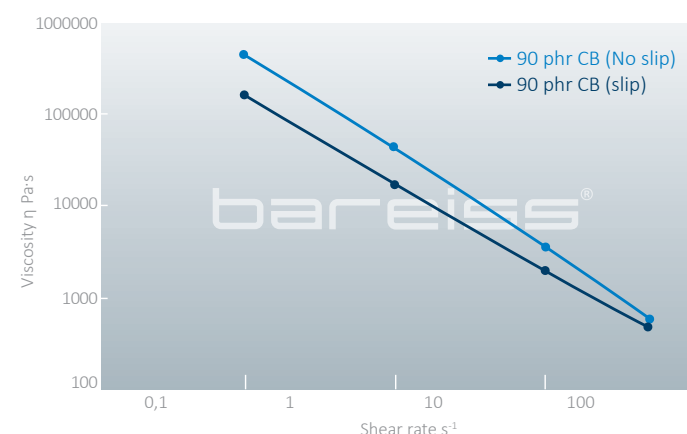
VISCOSITY OVER TIME

VISCOSITY OVER SHEAR RATE

Wall Slip

A significant challenge in the **processing of rubber compounds** is the issue of Wall Slip.

This is a rheological phenomenon where slippage occurs, for example, between the extruder wall and the flowing material. We offer an optional solution where the upper die is replaced by a defined polished die set. In combination with a programmable internal pressure, this allows Wall Slip experiments to be carried out.



Isothermal Test

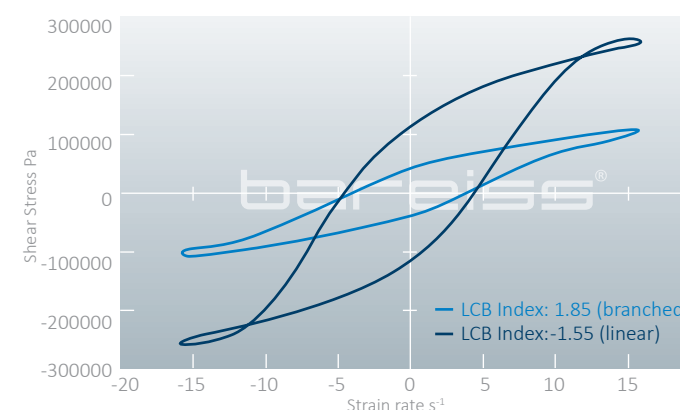
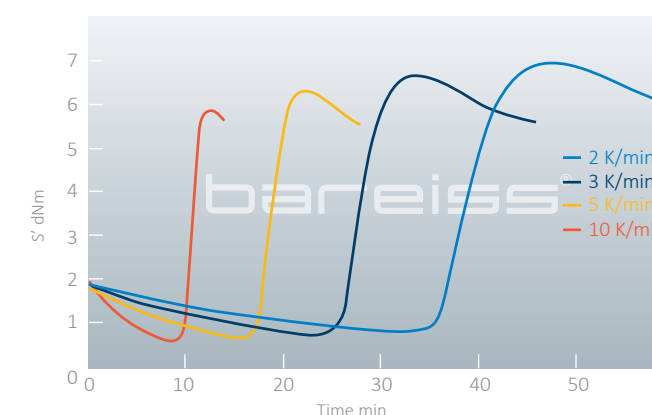
One of the most common and important tests performed on rubber compounds are the isothermal **cure tests**.

All important test parameters such as maximum and minimum torque, TC values, reaction time and rate, etc. are determined and made available to the user in tabular and/or graphical form for further analysis in the BareissOne software.

Non-Isothermal Test

In order to evaluate the behavior of a sample over a **wide temperature range**, non-isothermal measurements (temperature sweep) are typically performed at different heating rates.

This measurement at different heating rates also paves the way for **non-isothermal kinetic calculations** – a module that is also integrated into the BareissOne software.



Large Amplitude Oscillatory Shear (LAOS)

LAOS is essentially a strain sweep performed at relatively **large amplitudes** to investigate and evaluate the nonlinear viscoelastic behavior of a sample.

The nonlinear behavior of a material is based on its polymer architecture $\rightarrow$ linear or branched polymer. The LAOS results are also used for **FT- Rheology**. The calculation of the **LCB index** (Long Chain Branching) or the **Q-parameter** is performed using the harmonic spectrum from Fourier analysis (FFT).

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service@bareiss.de



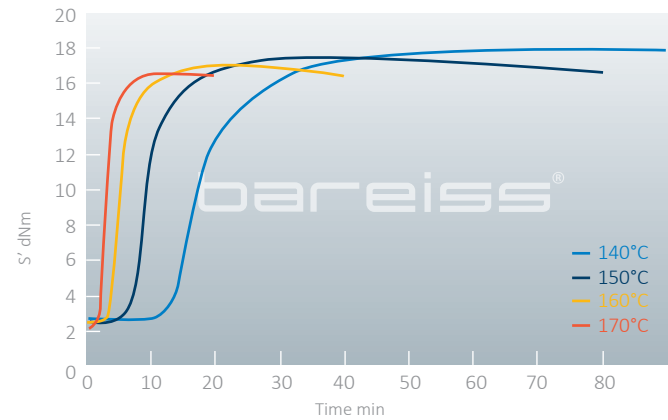
WE ARE YOUR
COMPETENT PARTNER.

For further information and advice on rheology, measurement methods and individual requirements, please contact our application team.

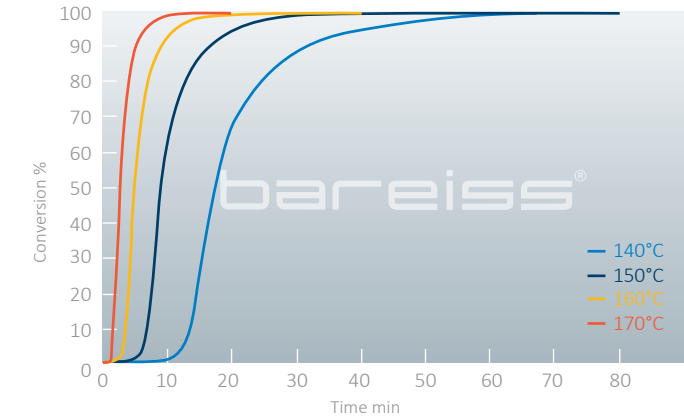


Kinetics

From an isothermal test, values such as incubation time, reaction order and conversion rate constant can be determined for each temperature. The calculation is according to the DIN 53529 standard. With the help of the incubation time and the conversion rate constant at at least 3 different temperatures,



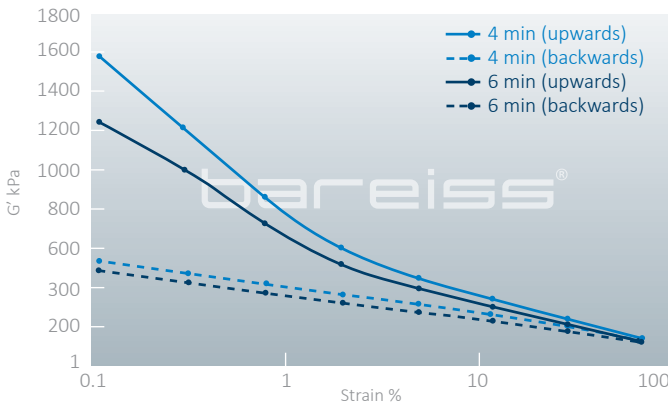
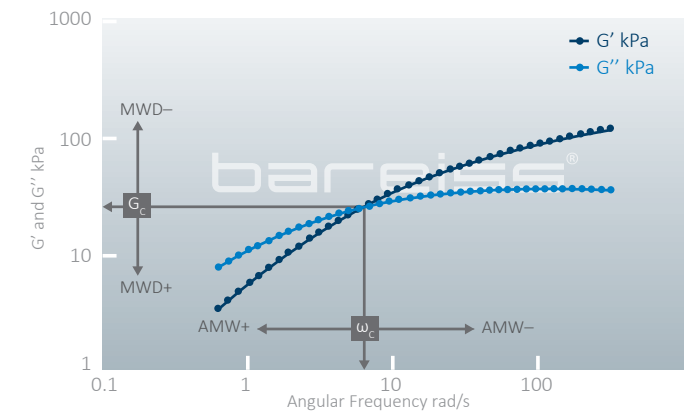
the activation energies of the incubation and the conversion can also be determined. These are essential parameters for the **computation of the heating time** for the test specimen and also finds its use in production line.



Frequency Sweep

By characterizing a sample over a wide range of frequencies, the user obtains a comprehensive overview of the viscoelastic behavior as well as the molecular structure (**molecular weight and molecular weight distribution**).

Viscoelastic properties such as complex modulus, elastic modulus, loss modulus, complex viscosity, phase angle, etc. are calculated at each frequency as a result of the frequency-dependent behavior of the sample.



Strain Sweep

Measuring a specimen over a wide strain range shows the **strain-dependent behavior**, e.g., the linear viscoelastic range (LVE) up to Large Amplitude Oscillatory Shear (LAOS).

The Payne test, which is performed at small strain amplitudes to investigate the (filler/polymer) filler networks, reveals information about the **filler content** and the **filler dispersion levels**.

Matrix test

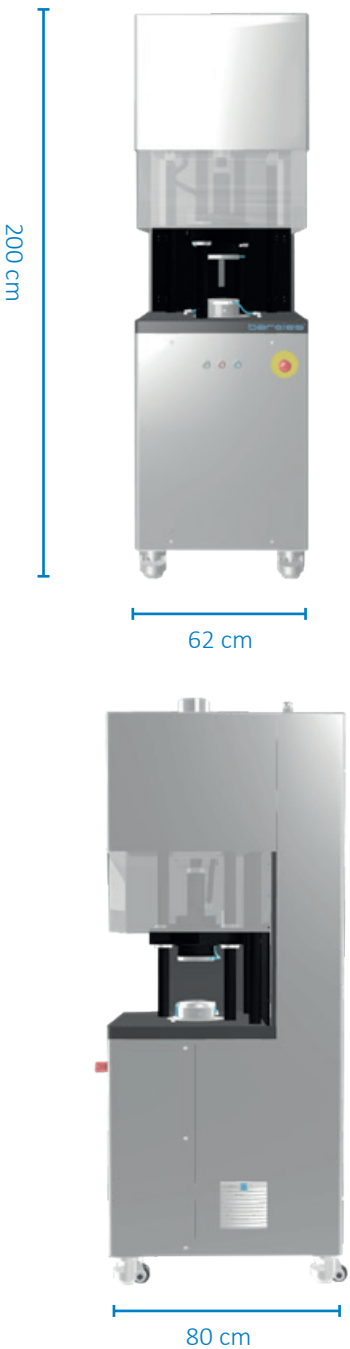
In the frequency and strain sweeps described above, one parameter (frequency or strain) is held constant while the other parameter (frequency or strain) is changed over a range.

Matrix testing allows the user to change both parameters – frequency and strain – during a sweep, making the **test method more flexible** and thus providing **more information with a single measurement**.



SPECIFICATIONS

ASTM D5289	ASTM D6048	ASTM D6204	ASTM D6601	ASTM D7050	ASTM D7605	ASTM D8059	ASTM D8491	ISO 6502	ISO 13145	DIN 53529
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Oscillation frequency	0.001 to 100 Hz
Oscillation strain	+/- 0.001° to 360° +/- 0.014% to 5000%
Rotation strain	360° - 36000° 5000% - 500000%
Max. shear rate in rotation	500 s ⁻¹
Max. shear rate in oscillation	100 s ⁻¹
Torque range	0.001 to 250 dNm
Temperature range	Ambient to 235°C
Max. heating rate	1.33°C/s (80°C/min)
Die config.	Sealed biconical die Optional: plate-plate, biconical polished
Die gap	0.48 mm nominal
Sample volume	4.5 cm ³
Test modes	Isothermal, Non-Isothermal, Strain Sweep, Frequency Sweep, Steady Shear, stress relaxation, LAOS, Matrix Test
Measured data	Torque, temperature, frequency, strain; Optional: Normal force/ sample pressure
Calculated data	G', G'', G*, S', S'', tan delta, n', n'', n*, ts1, ts2, TC10-TC90, S'min, S'max, LCB Index, reaction rate, and many more
Drive System	High-dynamic servo motor, High-resolution measurement technology

Measurements
W x D x H: 80 X 62 X 200 cm

Weight approx. 420 kg



SCALABLE RHEOLOGY – TAILORED TO YOUR GROWTH

RPA_{select}

RPA_{ultra}

MODEL TYPE		
Floor standing	✓	✓
FREQUENCY RANGE		
Standard 0.1- 10 Hz	✓	✓
STRAIN RANGE		
Oscillatory strain 0.1- 15 deg of arc	✓	✓
TORQUE TRANSDUCER		
0.001-250 dNm (0.0001-25 Nm)	✓	✓
TEMPERATURE RANGE		
Ambient to 230°C	✓	✓
CLOSING PRESSURE		
Standard 4.5 Bar	✓	✓
VARIABLE 2.5 to 8 Bar	⊕	✓
NORMAL FORCE/ SAMPLE PRESSURE SENSOR		
upto 10 kN	⊕	✓
TEST METHODS		
Standard Isothermal, Non-isothermal	✓	✓
Steady Shear/Ramp (Rotational mode) 360- 36000 deg of arc	⊕	✓
Frequency Sweep (0.0016- 100 Hz)	⊕	✓
Strain Sweep, LAOS (0.001- 360 deg of arc)	⊕	✓
Stress relaxation	⊕	✓
MatrixTest	⊕	✓
TEST STANDARDS		
Standard: ISO 6502, ISO 13145, DIN 53529, ASTM D5289	✓	✓
Optional: ASTM D6048, ASTM D6204, ASTM D6601 ASTM D7050, ASTM D7605, ASTM D8059 ASTM D8491, ASTM D5289	⊕	✓



ACCESSORIES

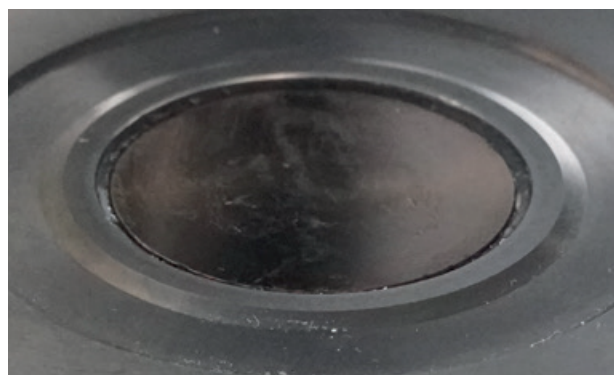
Wallslip Die Set



An optional polished die set is available for evaluating wall slip behavior in rubber compounds. By comparing results from standard and polished dies on the RPA, wall slip effects can be accurately measured. This data supports simulation engineers in building more precise models that better reflect real processing conditions

For further information on the test method and application, please contact the application team at Bareiss.

Optional Plate-Plate Die Set



An optional plate-plate die set is available for advanced testing at higher shear rates. The die gap can be manually adjusted, allowing users to tailor the shear conditions to their specific testing requirements.

For further information on the test method and application, please contact the application team at Bareiss

CONSUMABLES



Seal

Replacement seals for upper and lower dies of your MDR or RPA.



Test Films (roll)

For effortless sample handling and quicker test turnaround, optional polyester (Melinex) or polyamide (Dartek) films eliminate the need for frequent die cleaning.



SOFTWARE

BareissOne

BareissOne is a modularized software that is aimed to provide a common platform with integration of different test categories.

Whether it is a standard test for one single measurement or a series of tests that requires a complex test sequence editing, BareissOne is designed to offer all levels of user's demands.

Features such as user authorization, system log, project management, version control and custom report are all at your fingertips.

BareissOne has made software use easier than it ever was before.



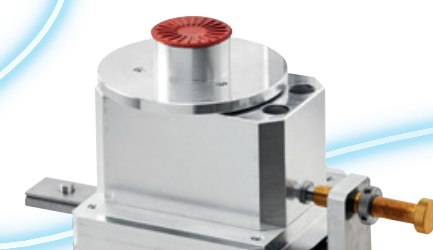
With its easy-to-understand icons and workflows, familiarizing yourself with the BareissOne software is only a matter of a few hours of training. Whether you are a new or experienced user, everyone can quickly start testing at the touch of a few clicks.

The new display layout gives the users a comprehensive view of the test workspace, identification of the test category and the available software functions.

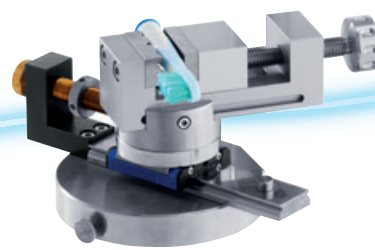


DIGI TEST II – OUR SMART AND RELIABLE CLASSIC.

HARDNESS TESTING FROM 0.7 MM MATERIAL THICKNESS.



CUSTOM SAMPLE HOLDERS



CENTERING DEVICE WITH
VICE FOR MOLDED PARTS

The modular digi test II offers you maximum flexibility in hardness testing of elastomers, polymers, soft elastic materials, composite materials, and foams. In just a few simple steps and without tools, the numerous measuring devices can be exchanged for Shore, VLRH, or IRHD, allowing for a quick transition between different measurement methods.



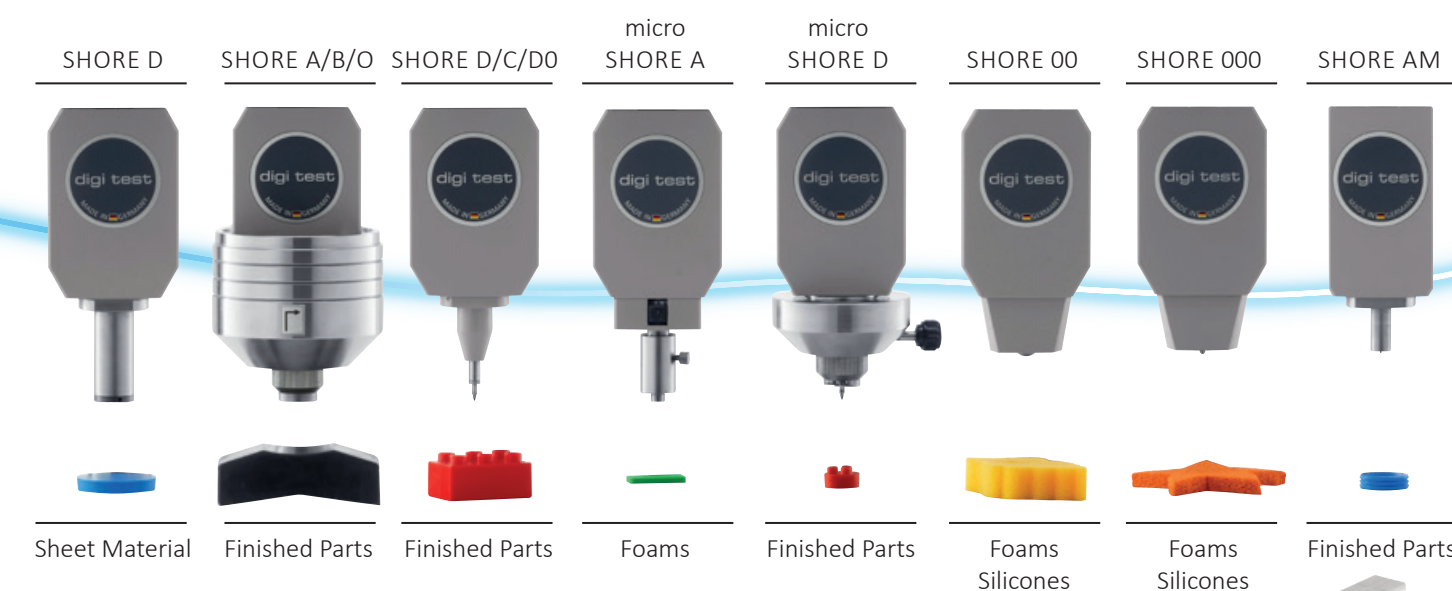
Sheet Material



CENTROFIX
FOR HOSES
AND CABLES

NOW WITH FREE QUICKMEASURE SOFTWARE.

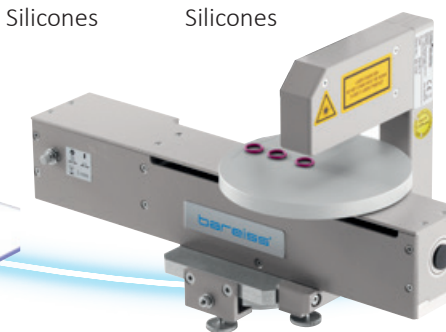
EXPANDABLE TO A COMPREHENSIVE SOFTWARE PLATFORM.



ROTOFIX
FOR MULTIPLE SAMPLES



BAROFIX FOR MANUAL
SAMPLE POSITIONING



BAROFIX 4 FOR AUTOMATIC
SAMPLE POSITIONING

The free software tool “BareissOne Quick-Measure” offers you the possibility to easily capture, print, and export your data in just a few steps.

Upgrading to the paid full version “BareissOne”, our unique and modular

software platform, allows you to centrally store and evaluate all measurement values of your Bareiss testing devices. The user-friendly interface provides statistical analysis of the measurement values with user management and automatic generation of test reports.

Whether it's a standard test for single measurements or a test series with complex text sequences, BareissOne meets your specific requirements. Features such as E-Signature for tamper-proofing of measurement values and Audit Trail complete the offering of the software platform.



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Deutsche
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D-K-15206-01-00

The accreditation is valid for the scope listed in certificate
D-K-15206-01-00 (mechanical measurands in the range of hardness).