

NETZSCH

Proven Excellence.



GABOMETER®

Intelligent Universal Flexometer

Analyzing & Testing

GABOMETER®

Intelligent Material Testing

Our GABOMETER® system – developed on the basis of the established Goodrich Flexometer – provides accurate measurements of heat build-up as well as blow-out tests and determination of the thermal set. Both, force- and elongation-controlled tests can be carried out with this state-of-the-art flexometer. The GABOMETER® is well suited to the task of improving the thermal dissipation and durability of semi-finished tire components, dampers or absorbers. Optionally, the new generation can also measure a material's stiffness (E modulus) and damping ($\tan \delta$) values.



- Pair of insulated compression sample holders aimed for Flexometer tests equipped with a contact thermocouple for recording the sample temperature on the surface of the test specimen during heat build-up tests
- Recording of the sample "centre" temperature within the core of the test specimen during heat build-up tests with a needle type thermocouple (horizontal operation) manual mode (optional)
- Automatic recording of the sample "centre" temperature within the core of the test specimen after heat build-up tests with a needle type thermocouple (vertical operation) driven by a pneumatic penetration system in an automatic mode (optional)

- Heat build-up and blow-out tests according to Goodrich (DIN 53 533, ASTM D 623, ISO 4666/3, ISO 4666/4, BS 903 part A50 and JIS K 6265)
- Compression set
- Dynamic visco-elastic properties*
- Tension flexometer tests*
- Fatigue tests*
- Programmable generator board for variable waveforms with automatic self-adjusting signal shape feedback loop*
- Creep test*
- Triple temperature measurement
 - Temperature sensor underneath the sample (standard)
 - Temperature sensor for chamber control (standard)
 - Temperature sensor at the core of the sample (needle type)*

* Optional

Intelligent Universal Flexometer



Your Advantages



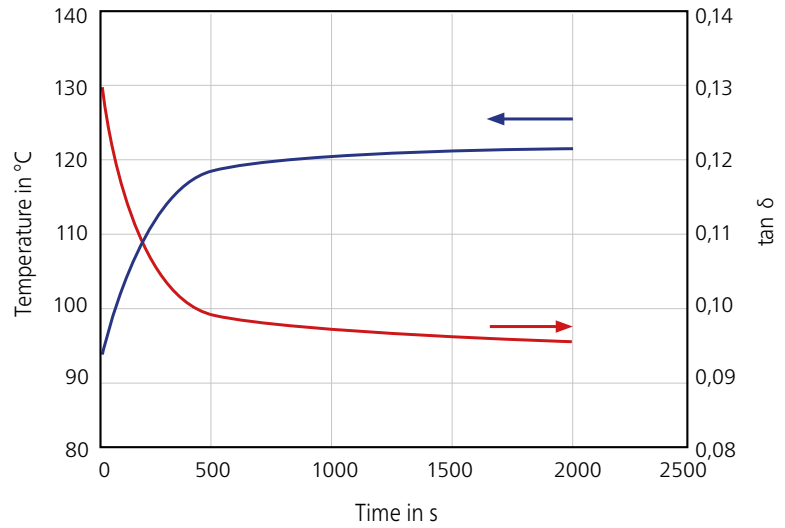
- Heat build-up and blow-out tests according to Goodrich (DIN 53 533, ASTM D 623, ISO 4666/3, ISO 4666/4, BS 903 part A50 and JIS K 6265)
- Goodrich flexometer tests
- Static: Strain- or stress-controlled load mode
- Dynamic: Strain- or stress-controlled load mode
- Wide frequency range*
- Wide temperature range*
- Automatic sample changer (ASC) for fully automatic testing (24h)*
- Simultaneous measurement of the visco-elastic properties*
- Visco-elastic properties in DMA mode*
- Hysteresis analysis*
- Pulse load mode*

* optional

GOODRICH FLEXOMETER TESTS



COMPRESSION

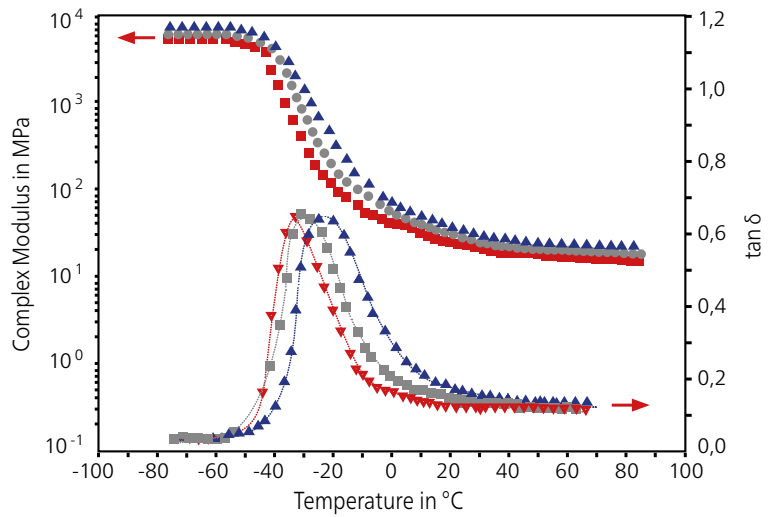


Heat build-up of ASTM D 623 SBR reference

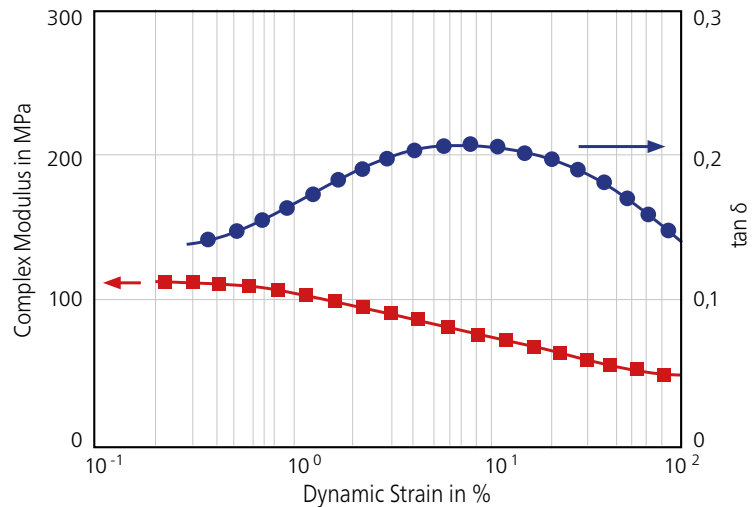
DYNAMIC DMA TESTS



TENSION

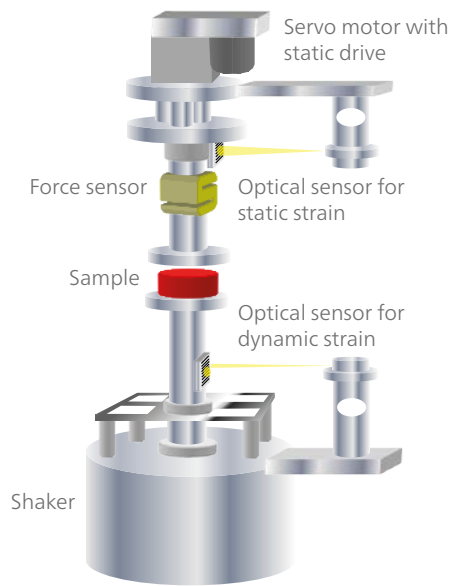


Glass transition

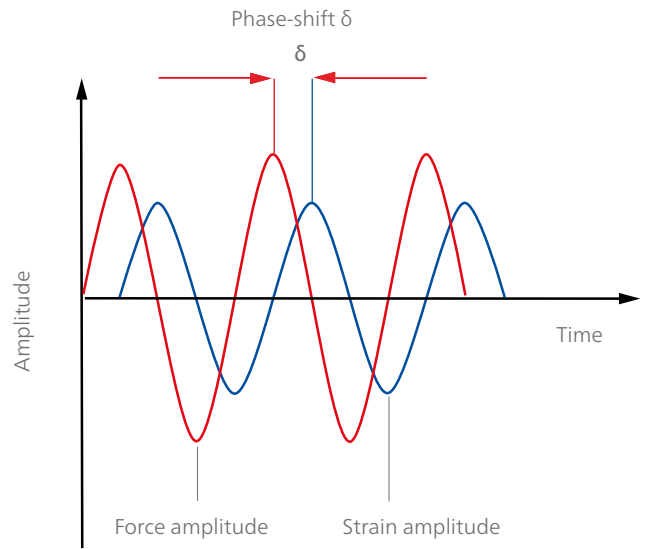


Dynamic strain sweep up to 100 %

Measuring Principle



GABOMETER® measuring principle



Phase-shift between force and strain is a measured amount in DMA mode

Automatic Sample Changer (ASC) Option


The optional automatic sample changer comprises a compression magazine for up to 60 specimens. A robot grip system pulls the samples out of the magazine and transfers them to the GABOMETER®.



Technical Specifications

	GABOMETER® 2000	GABOMETER® 4000
Test specimen size (diameter/thickness)	17.8 mm/25 mm	30 mm (< 40 mm optional)/25 mm
Static load drive	Shaker for servo motor	Shaker for servo motor
Dynamic load drive	Electrodynamic shaker system	Electrodynamic shaker system
Frequency range	30 Hz 0.5 up to 50 Hz continuously*	30 Hz 0.5 up to 50 Hz continuously*
Static strain range	up to 60 mm	up to 60 mm
Dynamic strain range	± 1.5 mm up to ± 10 mm	± 1.5 mm up to ± 10 mm
Force range	up to 2000 N	up to 4000 N
Temperature range	(-160°C, optional) RT up to 300°C	(-160°C, optional) RT up to 300°C
Temperature measurement	Mode A: Temperature in the furnace PT 100 or type K thermocouple Mode B: Temperature at the bottom of the cylindrical test specimen (type K thermocouple) Mode C: Vertical needle-type thermocouple at the center of the sample after measurement with automatic pneumatic drive* Mode D: Horizontal needle-type thermocouple at the center of the sample during measurement with manual mode*	
Measurement	<ul style="list-style-type: none"> ■ Heat build-up or blow-out of the test specimen ■ Compression set ■ Energy loss* ■ Visco-elastic properties only during the heat build-up tests (E', E'', tan δ, E*)* 	<ul style="list-style-type: none"> ■ Heat build-up or blow-out of the test specimen ■ Compression set ■ Energy loss* ■ Visco-elastic properties only during the heat build-up tests (E', E'', tan δ, E*)*
DMA Mode	Visco-elastic properties (E', E'', tan δ, E*)*	Visco-elastic properties (E', E'', tan δ, E*)*
Autosampler	<ul style="list-style-type: none"> ■ Magazine for 20 to 60 compression samples* ■ Tension, bending, shear tests for DMA* 	<ul style="list-style-type: none"> ■ Magazine for 20 to 60 compression samples* ■ Tension, bending, shear tests for DMA*
Electrical supply	3 phases, 400 V, 50/60 Hz, 32A	3 phases, 400 V, 50/60 Hz, 32A
Max. dimensions (height x width x thickness)	1800 mm x 1200 mm x 1200 mm	1800 mm x 1200 mm x 1200 mm
Max. weight	1300 kg	1300 kg

* optional



The NETZSCH Group is an owner-managed, international technology company with headquarters in Germany. The Business Units Analyzing & Testing, Grinding & Dispersing and Pumps & Systems represent customized solutions at the highest level. More than 3,700 employees in 36 countries and a worldwide sales and service network ensure customer proximity and competent service.

Our performance standards are high. We promise our customers Proven Excellence – exceptional performance in everything we do, proven time and again since 1873.

When it comes to Thermal Analysis, Calorimetry (adiabatic & reaction), the determination of Thermophysical Properties, Rheology and Fire Testing, NETZSCH has it covered. Our 50 years of applications experience, broad state-of-the-art product line and comprehensive service offerings ensure that our solutions will not only meet your every requirement but also exceed your every expectation.

Proven Excellence.■

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