

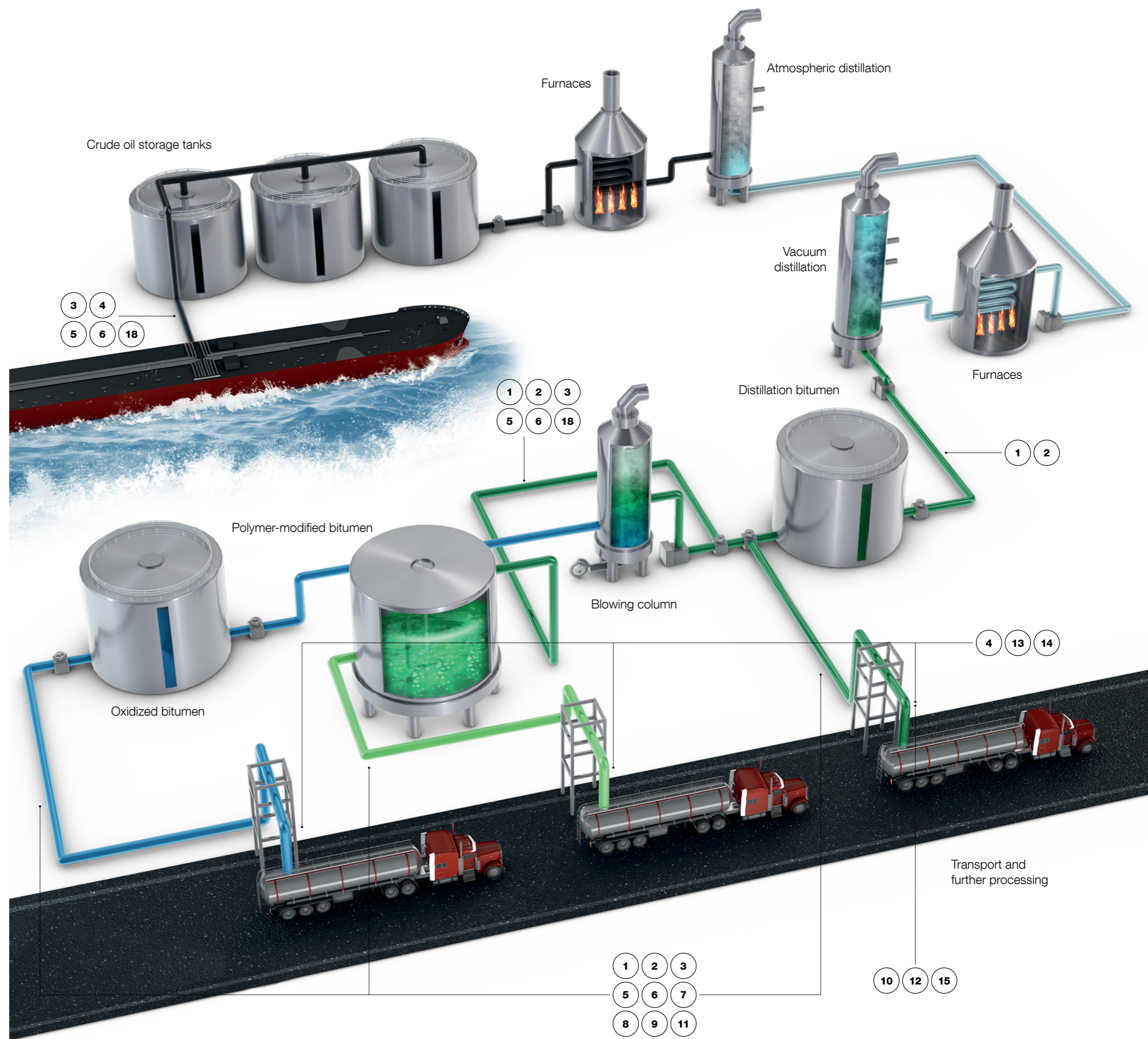
Your Way to Comprehensive Asphalt Measurement

Asphalt and Bitumen Portfolio



Production of Asphalt and Bitumen

Asphalt and bitumen literally ground our daily lives in the shape of roads, pavements, runways, and more. We offer a variety of solutions for measuring the density and viscosity as well as the deformation and flow behavior of e.g., asphalt components and compositions. Possible areas of application are the digestion of asphalt samples for subsequent trace analysis or the determination of parameters such as the softening point, breaking point, and penetration.



Dynamic Shear Rheometer: SmartPave 303

1

SmartPave 303 is based on the well-established EC motor system from MCR rheometers, meeting the highest measurement requirements, especially in research and development. It incorporates innovative features like Toolmaster, a Peltier temperature device for dry sample heating, and step-by-step instructions for measuring procedures that take bitumen and asphalt binder rheology to previously unattained levels of accuracy. With SmartPave 303, all rheological asphalt binder specifications according to international standards, such as ASTM, AASHTO, DIN EN, IS, GOST, and SATS, can be measured.

Standards:

- AASHTO T315, ASTM D7175 (SHRP test/ Superpave PG)
- AASHTO T316, ASTM D4402, DIN EN 13302 & 13702 (rotational viscosity)
- AASHTO T350, ASTM D7405, DIN EN 16659 (MSCR test)
- AASHTO TP101-UL (LAS test)
- AASHTO TP123 (BYET)
- FGSV AL 720 (BTSV)
- FGSV AL 721 (constant shear rate)
- FGSVAL 722 (temperature sweep)
- DIN EN 14770 (temperature sweep)
- FGSV AL 723 (MSCR test)

Parameters:

- Rotational viscosity
- Complex shear modulus
- Phase angle
- Performance grade
- Elastic response
- Temperature
- Non-recoverable creep compliance
- Percentage recovery



Dynamic Shear Rheometer: SmartPave 93

2

SmartPave 93, also based on the well-established, highly accurate EC motor system, is the ideal device for daily measuring routines and quality control in test laboratories. The step-by-step software, Toolmaster, TruRay (integrated light), QuickConnect (fast and easy mounting of the measuring system), and many other features guarantee excellent ease of use and convenient operation for rheological bitumen and asphalt measurements according to international specifications such as ASTM, AASHTO, DIN EN, IS, GOST, and SATS.

Standards:

- AASHTO T315, ASTM D7175 (SHRP test/ Superpave PG)
- AASHTO T316, ASTM D4402, DIN EN 13302 and 13702 (rotational viscosity)
- AASHTO T350, ASTM D7405, DIN EN 16659 (MSCR test)
- FGSV AL 720 (BTSV)
- FGSV AL 721 (constant shear rate)
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- DIN EN 14770 (temperature sweep)
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Parameters:

- Rotational viscosity
- Complex shear modulus
- Phase angle
- Performance grade
- Elastic response
- Temperature
- Non-recoverable creep compliance
- Percentage recovery



Rotational Rheometer: **RheolabQC**

3

RheolabQC is a robust and reliable instrument that measures the rotational viscosity of bitumen and asphalt products at elevated temperatures. The determination of flow curves and the temperature-dependent flow behavior of these materials give you valuable information about their processability. A Peltier temperature device ensures fast and accurate heating up to 180 °C, and disposable cups minimize the cleaning required.

Standards:

→ In correlation with ASTM D4402, AASHTO T316, and DIN EN 13302 (temperature control up to max. 180 °C)

Parameters:

→ Rotational viscosity
→ Temperature
→ Shear rate
→ Shear stress



Find out more

Density Meter for Petroleum Products: **DMA 4200 M**

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DMA 4200 M measures the density and specific gravity of highly viscous samples like bitumen and asphalt. Its U-tube made of Hastelloy C276 is highly resistant and virtually unbreakable. It improves, accelerates, and simplifies density measurement of bitumen and asphalt binders. With DMA 4200 M, tedious, manual, and time-intensive measurements with pycnometers or hydrometers belong to the past.

Standards:

→ ASTM D8188, in correlation with ASTM D70 and ASTM D3142

Parameters:

→ Density
→ API gravity
→ Relative density



Find out more

Rotational Viscometer: **ViscoQC 100**

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ViscoQC 100, with the electric temperature device ETD 300, is the entry-level setup for viscosity measurements of bitumen and asphalt in quality control. It is the ideal instrumentation for quick single-point tests at temperatures from 25 °C up to 300 °C, complying with international specifications such as ASTM, AASHTO, and DIN EN.

Standards:

- ASTM D4402
- AASHTO T316
- DIN EN 13302

Parameters:

- Rotational viscosity
- Temperature
- Shear rate
- Shear stress



Rotational Viscometer: **ViscoQC 300**

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ViscoQC 300 improves quality control of bitumen and asphalt with automated measuring methods and unique features such as TruMode™ (optimal speed detection) and Toolmaster™ (automatic spindle recognition). It can be paired either with the ETD 300 temperature device for flow curves of high-temperature measurements or with the PTD 175 Peltier temperature device, for demanding and fast temperature ramping tests.

Standards:

- ASTM D4402
- AASHTO T316
- DIN EN 13302

Parameters:

- Rotational viscosity
- Temperature
- Shear rate
- Shear stress



Fraass Breaking Point Tester: **BPA 5**

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The BPA 5 automatic Fraass breaking point tester determines the brittle behavior of bitumen and asphalt at low temperatures. A thin, flat steel plaque, coated with the sample, is flexed under specified conditions at a descending series of temperatures until a crack occurs.

Standards:

- EN 12593
- IP 80
- JIS K 2207

Parameters:

- Fraass breaking point



Find out more

Penetrometer: **PNR 500**

8

The PNR 500 is a fully automatic penetrometer for the reliable determination of the consistency of bitumen and asphalt binders by penetration testing. Designed for routine quality control, it minimizes operator influence and ensures excellent reproducibility and comparability of results. Its robust design, intuitive operation, and full compliance with international standards make the PNR 500 a dependable solution for daily laboratory work and product specification.

Standards:

- ASTM D5
- EN 1426
- AASHTO T49
- JIS K 2207

Parameters:

- Penetration



Find out more

Cleveland Flash and Fire Point Tester: **CLA 5**

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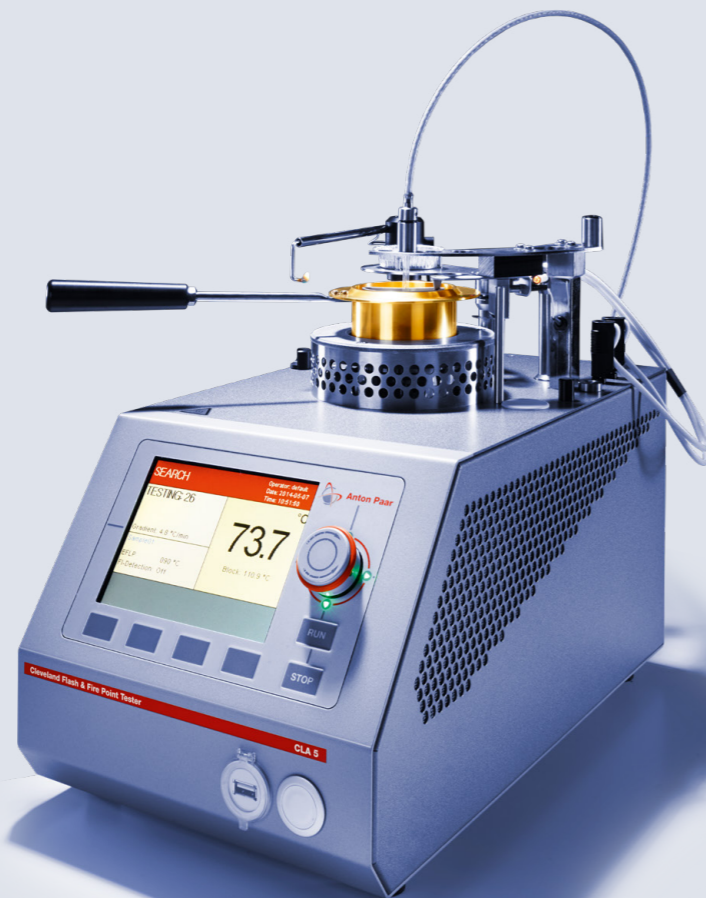
The CLA 5 automatic open-cup flash and fire point tester measures the flash point, which indicates the tendency to form a flammable mixture with air, and the fire point, which indicates the tendency for sustained burning in bituminous materials.

Standards:

- ASTM D92
- ISO 2592
- JIS K 2265-4
- AASHTO T48
- FTM 791-1103
- IP 36
- GOST 4333

Parameters:

- Flash point
- Fire point



Pensky-Martens Flash Point Tester: **PMA 500**

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The Pensky-Martens closed-cup flash point tester PMA 500 reliably measures the flash point of bituminous materials. Its new durable electric igniter, efficient cooling technology, and intuitive design reduce operating costs significantly.

Standards:

- ASTM D93
- ISO 2719
- IP 34
- JIS K2265-3

Parameters:

- Flash point



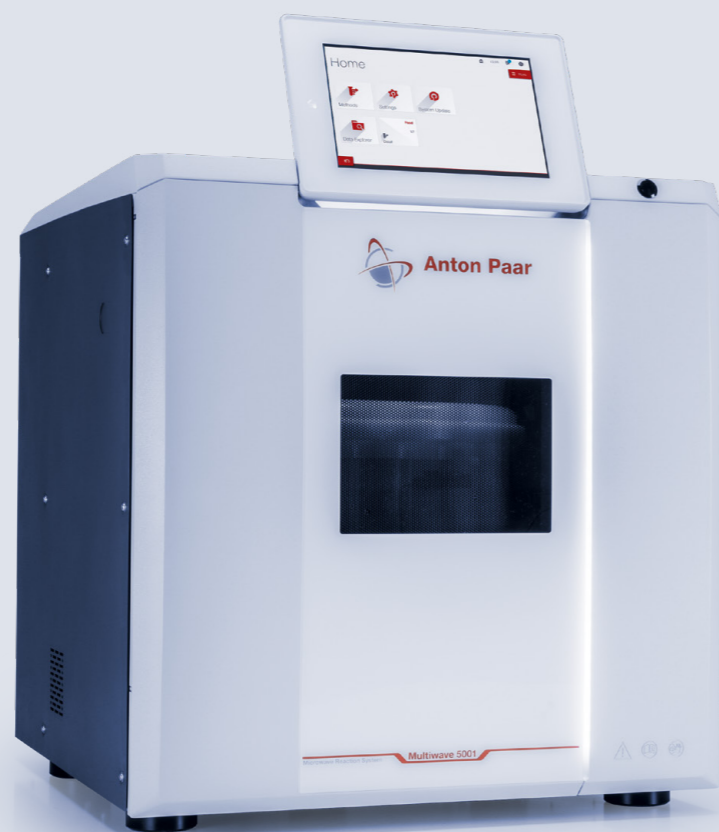
Microwave-Assisted Sample Preparation: **Multiwave 5001**

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Multiwave 5001 is a modular microwave reaction platform with a broad range of available rotors, vessels, and accessories. Its flexibility with regard to configuration allows not only acid digestion and leaching of bitumen and asphalt samples, but also solvent extraction for the determination of salt content in bitumen samples.

Parameters:

→ Sample preparation for elemental analysis



Find out more

Microwave-Assisted Acid Digestion: **Multiwave 7101/7301/7501**

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Multiwave 7101/7301/7501 completely digests your bitumen and asphalt samples for further analysis with ICP technology. When monitoring and analyzing contaminations, good sample preparation is a key factor: Only with the right microwave-assisted sample preparation can a complete and sufficient digestion be guaranteed.

Parameters:

→ Sample preparation for elemental analysis



Find out more

Laser Diffraction Particle Analyzer: **Litesizer DIF Series**

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The Litesizer DIF series measures the size of colloids in bitumen emulsions, enabling the optimization of application-relevant properties. The instrument is controlled by the user-friendly software Kalliope, and can be operated in the harshest environments due to its robust design. All optical components are mounted on a cast-iron base plate to ensure the system's permanent alignment.

Standards:

- ISO 13320
- ISO 9276

Parameters:

- Particle size
- Particle size distribution



Particle Size and Zeta Potential Analyzers: **Litesizer DLS Series**

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The Litesizer DLS series measure the zeta potential using the patented cmPALS technique to help you understand and modify the coagulation of bitumen particles, yielding insights into long-term stability of asphalt and bitumen emulsions. Absolute zeta potential values higher than ± 30 mV indicate a stable emulsion.

Standards:

- ISO 13099-2

Parameters:

- Zeta potential
- Particle size



Coriolis Flow Meters: L-Cor Series

15

Anton Paar's high-performance L-Cor Coriolis flowmeters provide a robust, highly accurate, and process proven solution for measuring bitumen in demanding industrial environments. Their ability to directly measure mass flow, density, and temperature makes them ideal for custody transfer, process control, and blending applications involving heavy hydrocarbons.

Standards:

→ OIML R117-1

Parameters:

→ Mass flow
→ Density



Find out more

FTIR Spectrometer: Lyza 7000

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Lyza 7000 is a standalone FTIR spectrometer with touchscreen interface that enables fast molecular identification, verification, and quantification for bitumen, asphalt binders, and related materials. FTIR spectra complement standard physical and rheological characterization by adding molecular-level information, supporting evaluation of binder aging and possible modification with additives. For quantification, users can create linear calibration methods to determine polymer additive levels.

Standards:

→ ASTM E1252

Parameters:

→ Infrared spectrum
→ Molecular identification
→ Quantification of polymer additive (e.g. SBS)
→ Aging indicators



Find out more

Solid Density Analyzer: **Ultrapyc Series**

17

The Ultrapyc series of gas pycnometers – with disposable metal cups – significantly reduces measurement time when determining bitumen purity and composition in comparison to the manual method according to ASTM D70. The instrument measures the density of bituminous semi-solids, asphalt binders, and mixtures for paving requirements.

Standards:

→ ASTM D4892

Parameters:

→ Density



Differential Scanning Calorimeter: **Julia DSC Series**

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Differential Scanning Calorimetry (DSC) is a powerful analytical technique for investigating the thermal behavior of bitumen and asphalt binders, especially modified systems containing waxes (e.g., Sasobit), polymers, or additives. By measuring heat flow as a function of temperature, DSC provides direct insight into phase transitions and crystallization phenomena that strongly influence processing, performance, and durability. In modern asphalt design, DSC complements rheological and viscosity measurements by adding thermodynamic information to mechanical characterization.

Standards:

→ Widely applied in research but no standard yet existing

Parameters:

- Melting temperature (T_m)
- Crystallization temperature (T_c)
- Glass transition temperature (T_g)
- Enthalpy of fusion / crystallization (ΔH)
- Degree of crystallinity
- Heat capacity changes (C_p)

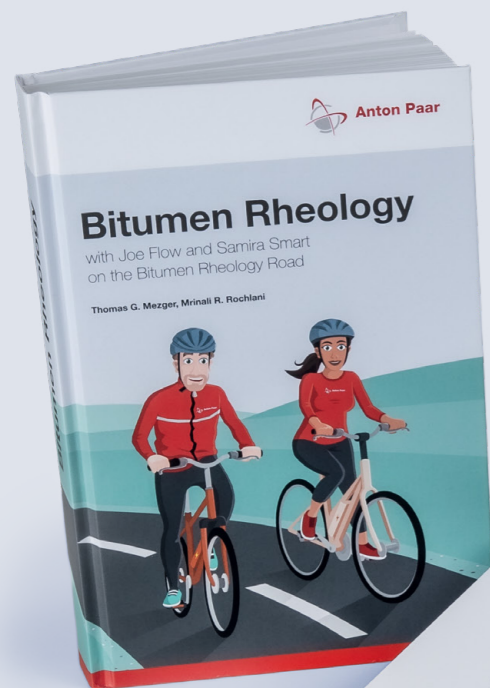


Get Our Latest Bitumen Rheology Book

Although Bitumen Rheology, by Thomas G. Mezger and Mrinali R. Rochlani, was written primarily for those new to rheology and rheometers, it's also a great resource for industry practitioners, teachers, and students. In the book, Joe Flow, our rheology expert, and Samira Smart, our bitumen specialist, take you on a journey on the Bitumen Rheology Road.

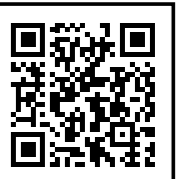
Along the way, you'll learn about:

- The history, production, chemistry, and grading of bitumen
- Concepts of rheology, such as viscosity, elasticity, and visco-elasticity
- Viscometers, rheometers, and sample preparation
- Testing types, including rotation, creep-and-recovery, relaxation, oscillation, and dynamic mechanical analysis (DMA), according to current international standards
- Enhanced analysis of amplitude sweeps and frequency sweeps as isotherms, master curves, Cole-Cole Plots, and Black Diagrams



Get your copy now

Reliable. Compliant. Qualified.



Find out more

Our well-trained and certified technicians are ready to keep your instrument running smoothly.

Maximum uptime

Regardless of how intensively you use your instrument, we help you keep your device in perfect shape and safeguard your investment. For at least 10 years after the discontinuation of a device, we'll provide you with any service and spare part that you might need.

Warranty program

We're confident in the high quality of our instruments. That's why we provide a full three-year warranty. Just make sure to follow the relevant maintenance schedule. You can also extend your instrument's warranty beyond its expiration date.

Short response times

We know that sometimes it's urgent. That's why we provide a response to your inquiry within 24 hours. We give you straightforward help from experienced people, not from bots.

Global service network

Our large service network for customers spans 85+ locations with more than 600 certified service technicians. Wherever you're located, there's always an Anton Paar service technician nearby.



