



Anton Paar

General Catalog

Anton Paar develops, produces, distributes and provides support for analytical instruments used in research, development and quality control worldwide.

Ever since Mr. Anton Paar founded his one-man workshop in 1922, the Austrian-based company has continuously found new ways to merge high-precision engineering with scientific curiosity. The company currently has more than 1600 employees and is active in over 110 countries worldwide.

Anton Paar is the world market leader in the field of density measurement, the determination of dissolved CO₂ and the analysis of materials' deformation and flow behavior. Customers of Anton Paar include the biggest international soft drink producers and breweries, petroleum and food companies, the chemical and pharmaceutical industries, Formula 1 racing teams and many more.

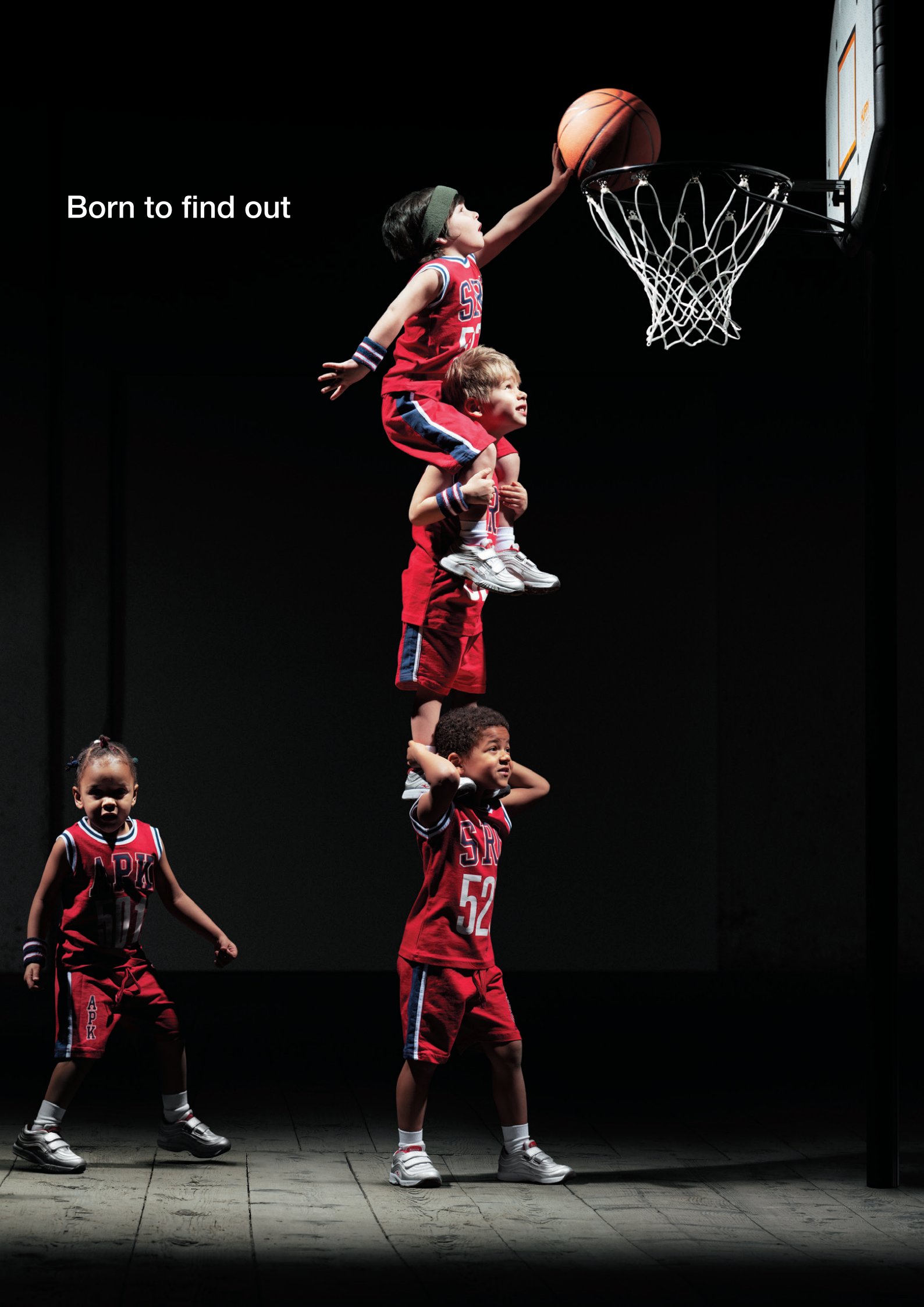
The company Anton Paar is committed to long-term partnerships with customers and employees as well as responsibility towards society in general.

The Santner Foundation

Since 2004 Anton Paar has been owned by the Santner Foundation, a non-profit organization exclusively and directly aimed at charitable work and serving the public good. The foundation supports non-commercial scientific work and research in the field of natural science and technology for public utility; addiction prevention and the rehabilitation of drug addicts.



Born to find out



Innovation and tradition

Innovation builds on research and development, but goes beyond technology and involves all of Anton Paar's employees. Innovation is the art of finding answers before the question is asked.

Customers deserve reliable application solutions which are precise, economic and easy to use. Anton Paar customers can always expect more: Here are some of the reasons why.

- ▶ Approx. 20 % of Anton Paar's turnover invested into Research & Development
- ▶ Numerous cooperations with leading universities and research centers
- ▶ New Research Center for Analytical Instrumentation
- ▶ 100 % of instrument production in-house following strict quality guidelines
- ▶ Diversified portfolio: Extensive range of solutions from a single source
- ▶ Traditionally close-knit contact with the international scientific community
- ▶ Longstanding tradition of high-precision manufacturing

Anton Paar offers a range of instruments which provide complete conformity and traceability to meet stringent reference standards and national and international regulatory requirements.

Close to your site, close to your experience

In addition to a broad product portfolio, Anton Paar meets your needs with its worldwide sales and service network. Experienced and dedicated specialists trained in-house are at your service at Anton Paar's 20 sales and service subsidiaries, 10 sales offices and joint ventures as well as over 70 distribution partners around the globe.





Custom-tailored installation

Your measurement solution of choice is installed on-site by Anton Paar's sales and service engineers in accordance with your individual requirements. Our engineers are at your service from the moment you choose an Anton Paar solution.

Anton Paar application support

Define the application, choose your features and benefit from the company's application know-how. Anton Paar provides a wide range of application solutions which embody decades of technical expertise.

Dedicated training programs

Anton Paar offers customer trainings and qualifications tailored to every knowledge level, providing you with future-oriented tips and advice for your measuring requirements and the opportunity to exchange information with Anton Paar engineers experienced in your field of application.

Anton Paar Certified Service

From the recommended preventive maintenance programs to repair coverage and emergency service, Anton Paar accompanies you with certified service programs throughout the whole life cycle of your instrument.

Anton Paar for Pharma

Anton Paar supports you with an instrument-specific qualification and validation package for defined instruments. This package fulfills the requirements of GMP, 21 CFR Part 11, GAMP 5, USP<1058> and covers all steps of a complete instrument qualification.

Density and Concentration Determination

Density Meters: DMA Generation M

The DMA Generation M density meters measure the density and concentration of liquids. They provide preset measuring methods and integrated conversion tables for many applications. The FillingCheck™ function automatically detects filling errors and gas bubbles in the sample to avoid measuring errors.

Specifications

Accuracy, density:

0.0001 g/cm³ (DMA 4100 M)
0.00005 g/cm³ (DMA 4500 M)
0.000005 g/cm³ (DMA 5000 M)

Repeatability s.d., density:

0.00005 g/cm³ (DMA 4100 M)
0.00001 g/cm³ (DMA 4500 M)
0.000001 g/cm³ (DMA 5000 M)



Density Meter: DMA 500

Accuracy, density:

0.001 g/cm³

Repeatability s.d., density:

0.0002 g/cm³

Min. sample volume:

approx. 1 mL

Maximum off-the-line operation:

2 h (optionally 6 h)

DMA 500 is a convenient, compact laboratory density meter providing renowned DMA measurement quality at the push of a button. Operations with DMA 500 are safe against voltage fluctuations and power outages due to the instrument's integrated rechargeable battery, which also enables flexible off-the-line operation.

Portable Density Meter: DMA 35

The DMA 35 portable density meter measures the density and concentration of samples on-site. An Ex version is available for use in hazardous areas. The housing of the DMA 35 Ex Petrol version is resistant to petrols and similar organic samples. Results are given as density and concentration, such as °Brix, %v/v alcohol and API gravity.

Accuracy:

0.001 g/cm³

Repeatability s. d.:

0.0005 g/cm³

Measuring range:

0 g/cm³ to 3 g/cm³

Minimum sample volume:

2 mL



Density and Concentration Determination



Specifications

Accuracy, density:
0.000005 g/cm³

Accuracy, sound velocity:
0.5 m/s

Accuracy, concentration:
0.01 % to 0.1 % (typically)

Measuring time per sample:
1 minutes to 4 minutes

Density and Sound Velocity Meter: DSA 5000 M

DSA 5000 M automatically determines the density of and sound velocity within samples. This allows determination of the concentration of sulfuric acid and oleum in the concentration range from 0 to 114 % H₂SO₄, and determination of the concentration of three-component samples. It provides automatic viscosity correction of the results.

External Measuring Cells: DMA HP/HPM

The DMA HP and DMA HPM external measuring cells measure density at high sample pressures and/or high temperatures. DMA HP is the expert solution for highly viscous samples with high melting points like bitumen. DMA HPM is commonly used in reservoir studies, either integrated into a PVT analysis or slim tube apparatus for enhanced oil recovery (EOR) experiments.

Measuring range:
Temperature: -10 °C to 200 °C

Pressure range (DMA HP):
0 bar to 700 bar

Pressure range (DMA HPM):
0 bar to 1400 bar

Accuracy, density:
up to 0.0001 g/cm³



Thermometry and Calibration: MKT 50 Millikelvin Thermometer

Measuring range:
Temperature: -260 °C to 962 °C
Resistance: 0 Ω to 440 Ω

Measurement uncertainty:
Temperature: < 1 mK (Pt 100)
Resistance: 400 μΩ at reference temperature 23 °C

Measuring sensor:
Pt 100 or Pt 25.5
(DIN IEC 751 or ITS-90 or ASTM 1137)

The MKT 50 millikelvin thermometer is designed for the most accurate temperature measurements, comparison calibrations and fixed point calibrations. In combination with standard and industrial platinum resistance thermometers, MKT 50 achieves a measuring uncertainty of 10 mK. Combined with high-end SPRT sensors, a system uncertainty of as low as 1.4 mK can be reached.



Density and Concentration Determination

Sample Changers: Xsample 22/122

Xsample 22 and Xsample 122 are economical Plug and Play solutions for automated sample filling, ranging from a single sample up to 96 samples.

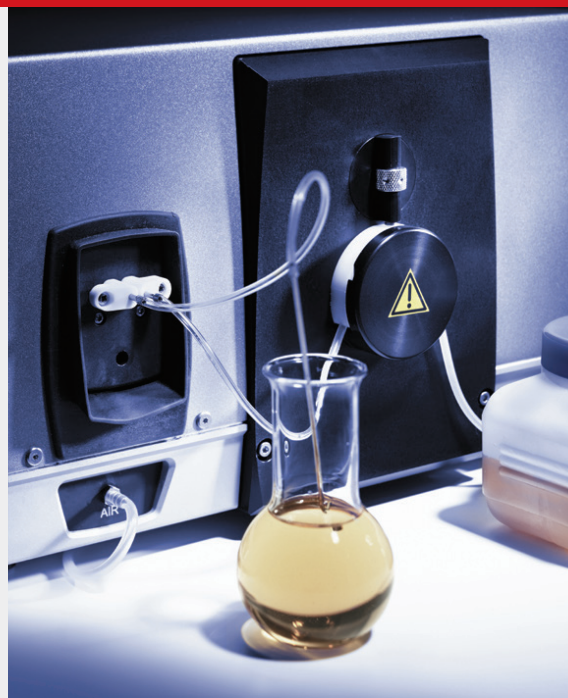
The sample changers' robust design promises virtually maintenance free and easy long-term operation.

Specifications

Sample viscosity:
3000 mPa.s

Filling mode:
Peristaltic pump

Sample vials per measuring cycle:
Xsample 22: 1
Xsample 122: 24 (50 mL), 48 (12 mL)
or 96 (12 mL)



Sample viscosity:
Xsample 52: 500 mPa.s
Xsample 352/452: 35,000 mPa.s
Xsample 352 H/452 H:
15,000 mPa.s at 80 °C

Filling mode:
Xsample 52: Piston pump
Xsample 352/452/352 H/452 H:
Piston pump and overpressure

Sample vials per measuring cycle:
Xsample 52/352/352 H: 1
Xsample 452: 24 (50 mL),
48 (12 mL) or 96 (12 mL)
Xsample 452 H: 44 (12 mL)

Sample Changers: Xsample 52/352/452

The Xsample 52, Xsample 352 and Xsample 452 sample changers are complete automated solutions for sample filling, rinsing and drying. In addition, the Xsample 352 H and 452 H heated sample changers are specifically developed for handling highly viscous samples at temperatures up to 80 °C.

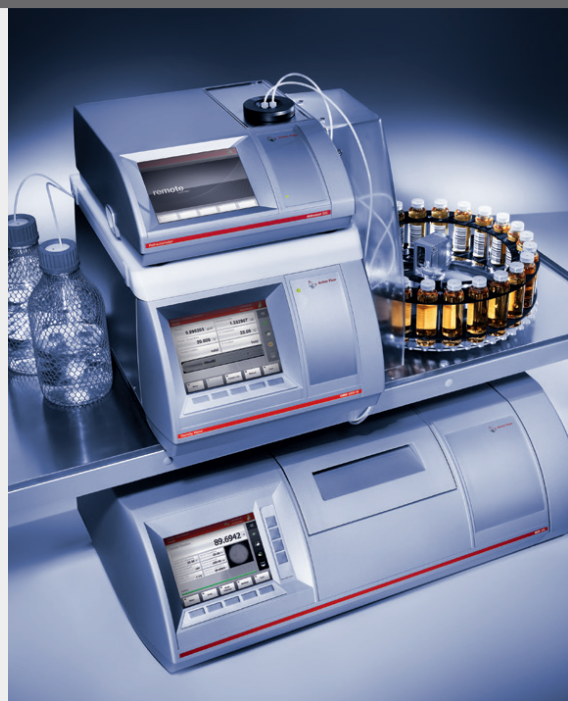
Multiparameter Measuring Systems: Modulyzers

Start with Modulyzer Prime Class, a compact measuring system to measure density and refractive index in one go.

Powerful modularity, as realized in the Modulyzer Unlimited Class, allows you to build countless combinations to fit your specific application. Using both Anton Paar equipment as well as third-party instruments, you can measure up to 7 parameters.

Choice of parameters:
Density, refractive index,
optical rotation, turbidity,
viscosity, pH, color

Automation software:
Modulyzer Unlimited Class:
tiamo™ from Metrohm





Specifications

°Brix range:
0 °Brix to 80 °Brix
0 % to 100 % degree of inversion

Repeatability:
Actual °Brix: 0.01 °Brix
Fresh/inverted: 0.02 °Brix
Degree of inversion: 1 %

Measuring time per sample:
5 minutes incl. filling

Soft Drink and Syrup Analysis: Soft Drink Analyzer M

The Soft Drink Analyzer M determines the fresh, actual and fully inverted sugar concentration and degree of inversion in soft drinks and syrup. Combined with the Xsample 122 sample changer, the system guarantees fast and accurate measurements.

Diet, Brix, CO₂, Sugar Inversion: PBA-S/SD/SI Generation M

The PBA-S/SD modular analysis systems allow you to determine °Brix in regular soft drinks, while PBA-SD additionally measures Diet concentration in diet drinks. PBA-SI is used for soft drinks with sugar inversion to measure the correct Brix value.

All systems determine your sample's CO₂ content without sample preparation.

Repeatability s.d.:

Regular soft drinks: 0.01 °Brix
Diet soft drinks (colored): 0.2 %
Diet soft drinks (colorless or turbid): 0.4 %

Regular soft drinks with sugar inversion:

0.01 °Brix actual
0.02 °Brix fresh/inverted
1 % degree of inversion
CO₂: 0.01 g/L (0.005 vol.)

Optional:

O₂ measurement



Sample Changer: Xsample 510 Package Sampler

The Xsample 510 package sampler enables the fully automatic filling and cleaning of modular Anton Paar PBA measuring systems. Whether from glass bottles, PET bottles or cans, Xsample 510 fills samples into measuring chambers directly from their closed packages.

Filling mode:
Pressurized filling from closed
packages

Packages per rotary table:
up to 18 packages

Package types:
Cans: 0.25 L, 0.33 L, 0.5 L
Glass bottles: 0.33 L, 0.5 L
PET bottles: 0.5 L, 1 L, 1.5 L, 2 L, 3 L



Analysis of Dissolved Gases

Lab and At-line CO₂ Measurement: CarboQC/CarboQC ME/CarboQC At-line

Whether directly at the production line or in the laboratory, CarboQC and CarboQC At-line measure the true amount of dissolved carbon dioxide in soft drinks, beer, wine, and sparkling water. Measurements typically take 55 seconds.

The CarboQC ME measuring module is easily integrated into Anton Paar beverage analysis systems such as PBA-S, PBA-SI, PBA-SD and PBA-B.

Specifications

Measuring range:

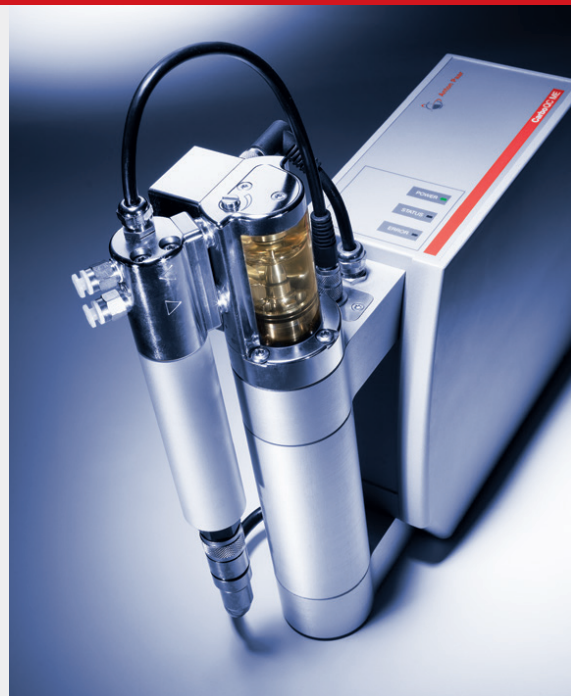
CO₂: 0 g/L to 12 g/L (0 vol. to 6 vol.) at 30 °C,
0 g/L to 20 g/L (0 vol. to 10 vol.) < 15 °C

CO₂ repeatability s.d.:

Lab: 0.01 g/L (0.005 vol.)
At-line: 0.04 g/L (0.02 vol.)

CO₂ reproducibility s.d.:

Lab: 0.05 g/L (0.025 vol.)
At-line: 0.1 g/L (0.05 vol.)



Measuring range:

CO₂: 0 g/L to 12 g/L (0 vol. to 6 vol.) at 30 °C,
0 g/L to 20 g/L (0 vol. to 10 vol.) < 15 °C
O₂: 0 ppm to 4 ppm

CO₂ repeatability s.d.:

Lab: 0.01 g/L (0.005 vol.)
At-line: 0.04 g/L (0.02 vol.)

O₂ repeatability s.d.:

± 2 ppb

Combined CO₂ and O₂ Measurement: CboxQC/CboxQC At-line

Anton Paar's new analyzer CboxQC combines the fast measurement of CO₂ and O₂ in one measuring cycle - available for portable use at-line as well as in a stand-alone version for the laboratory. Measurements typically take 90 seconds.

Portable O₂ Determination: OxyQC

The highly accurate determination of dissolved oxygen is based on the new optochemical sensor's very fast response time and ideal temperature behavior. This leads to stable and precise results in less than 50 seconds. Durability and minimal maintenance are the prominent features that make this long-lasting optical sensor stand out.

Measuring range:

O₂: 0 ppm to 4 ppm

Repeatability s.d.:

± 2 ppb

Reproducibility s.d.:

± 4 ppb





Specifications

Repeatability s.d.:

Alcohol: 0.01 %v/v
Original extract: 0.03 °Plato
Extract: 0.01 %w/w

Typical measuring time:

4 minutes incl. filling

Options:

Color, pH, turbidity

Beer Analyzing System: Alcolyzer Beer ME

Alcolyzer Beer ME in combination with a DMA M density meter determines the alcohol content, real, apparent and original extract as well as calories of all types of beers, beer mixtures, ciders, and malt beverages. The patented, MEBAK-approved NIR measuring method eliminates the influence of other sample constituents on the alcohol measurement and therefore generates highly precise results.

Packaged Beverage Analyzer for Beer: PBA-B Generation M

PBA-B Generation M combines an Alcolyzer Beer ME, a density meter (DMA 5000 M or DMA 4500 M), the CarboQC ME, and the PFD filling device. A measuring cycle takes 4 minutes. No sample preparation such as degassing is required. The sample is measured directly from the package in a closed system, without loss of CO₂ or alcohol.

Repeatability s.d.:

CO₂: 0.01 g/L (0.005 vol.)
Alcohol: 0.01 %v/v
Original extract: 0.03 °Plato
Extract: 0.01 %w/w

Measured parameters:

Alcohol, real extract, original extract, apparent extract, CO₂, degree of fermentation, calories

Options:

Color, pH, turbidity, O₂



Turbidity Measuring Module: HazeQC ME

Measuring range:

0 EBC to 100 EBC
(0 NTU to 400 NTU)

Resolution:

0.01 EBC or NTU

Measuring temperature:

-5 °C to 40 °C Peltier-controlled measuring cell

HazeQE ME measures the turbidity of beverages such as beer and beer mixtures using a MEBAK and EBC compliant measuring method.

HazeQC ME is typically connected to Anton Paar beverage analyzing systems. HazeQC ME provides a temperature-controlled 3 mL flow-through cell. Therefore, no water bath or color calibration are necessary.

Wine Analysis: Alcolyzer Wine/Sake

Alcolyzer Wine measures the alcohol content of wine, sparkling wine, cider and sake using a patented NIR measuring method. Other sample constituents do not influence the alcohol analysis. In combination with a density meter, the system can also measure extract.

Specifications

Measuring range:

Wine: 0 %v/v to 20 %v/v

Repeatability s.d.:

0.01 %v/v alcohol

Typical measuring time:

less than 3 minutes incl. filling

Options:

pH, turbidity



Spirits Analysis: Alcolyzer Spirits

Measuring range:
Spirits: 35 %v/v to 65 %v/v

Repeatability s.d.:
0.01 %v/v alcohol

Typical measuring time:
less than 3 minutes incl. filling

Options:
pH, color, turbidity

Alcolyzer Spirits determines the alcohol content (35 %v/v to 65 %v/v) of alcoholic beverages. In combination with a density meter, the system additionally determines the total extract of the sample.

Spirits Analysis: DMA 5000 M

The amount of alcohol in spirits is the basis for the payment of taxes. An officially recognized method for the determination of alcohol concentrations in alcohol/water mixtures is the measurement of density followed by conversion into alcohol concentration using official alcohol tables. DMA 5000 M - the most accurate density meter on the market - accurately determines alcohol in binary mixtures and consequently helps to save money.

Measuring range:

0 %v/v to 100 %v/v alcohol

Accuracy:

0.01 %v/v

Alcohol tables:

OIML, OIML-ITS-90, AOAC, IUPAC, HM C&E, Proof





Specifications

Analyzed sugar beet parameters:

- Sugar content (polarization, °Z)
- Potassium (K)
- Sodium (Na)
- α-amino nitrogen (α-N)

Calculation of relevant data:

- Sugar yield
- Molasses sugar content

Lead- and alternatively clarified samples can be measured at a sample rate of 120/h

Quality Analysis of Sugar Beet: Betalyser

The Betalyser laboratory system analyzes sugar beet quality according to official ICUMSA methods. Using this solution, a payment system for sugar beet can be established based on technical quality, but not just on tonnage or polarization.

By optimizing fertilization and cultivation, a higher beet quality is achieved in a short period of time. Better sugar beet varieties with high sucrose content and a genetically improved white sugar yield can be developed.

Measurements of Apparent Purity, Polarization and Dry Substance: MCP Sucromat and Abbemat Series

MCP Sucromat polarimeters and Abbemat refractometers are combined into an efficient team for enhancing sugar factories' performance. Raw, intermediate and final products of sugar manufacture are subjected to fast, automated analyses to determine sugar content (°Z), dry substance (°Brix) as well as apparent purity.

To measure polarization (°Z):

MCP 200/250/300/500 Sucromat

To measure dry substance (°Brix):

Abbemat HP
Abbemat 300/500
Abbemat 350/550



Reflectance Colorimeter for White Sugar: Sucroflex

Sucroflex is a reflectance colorimeter for color grading white sugar crystals.

The reflectance color is an eye-catching quality factor of white sugar crystals. In the past, the reflectance color was estimated visually, so findings depended on illumination and the operator.

Sucroflex replaces this visual estimation by a precise photoelectric measurement.

Reflectance color measurement of white sugar crystals:

Compliant with ICUMSA standard GS2-13

Displays results in ICUMSA color type units

PTB certified ceramic standards for adjustment available

Results independent of operator



Modular Circular Polarimeter Series: MCP 200/300/500

The MCP series is a range of high-quality polarimeters for research and industry. The modular instruments measure the optical rotation of liquids and employ derived scales to determine the concentration or specific rotation of optically active substances.

The systems' powerful automatic Peltier temperature control quickly establishes temperature equilibrium inside the sample cell. The Toolmaster™ feature automatically identifies sample cells and quartz control plates, ensuring reliable, traceable measurement results and adjustments.

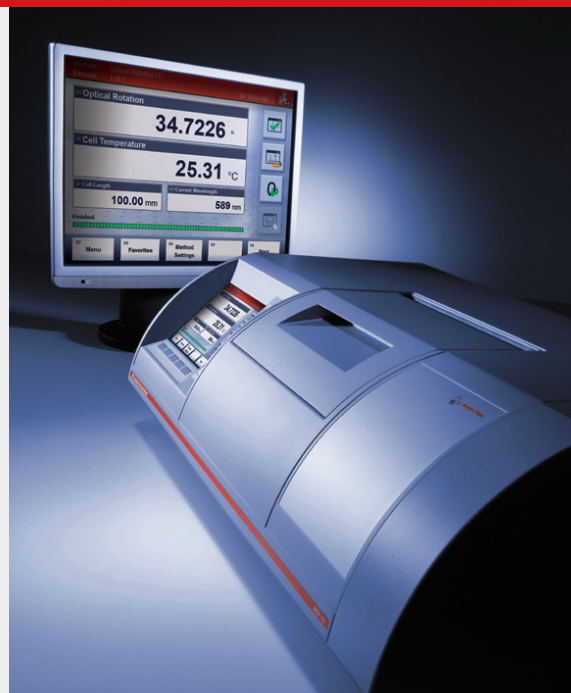
Specifications

Measuring range:
± 89° OR

Resolution:
0.001° to 0.0001°

Accuracy:
0.005° (MCP 200)
0.003° (MCP 300)
0.002° (MCP 500)

Temperature control:
15 °C to 45 °C (Peltier system)



Measuring range:
± 259 °Z

Resolution:
0.01 °Z

**Accuracy,
MCP 300/500 Sucromat:**
0.01 °Z

**Accuracy,
MCP 200/250 Sucromat:**
0.02 °Z

Saccharimeters: MCP 200/300 Sucromat, MCP 250/500 Sucromat

MCP Sucromat is used to analyze °Z (International Sugar Scale). While MCP 200/300 Sucromat measures at 589 nm, MCP 250/500 Sucromat measures at 589 nm and 880 nm. This extra wavelength allows analysis of strongly colored filtrates.

Another solution for sugar is the Betalyser system, for complete sugar beet analysis according to official ICUMSA methods.

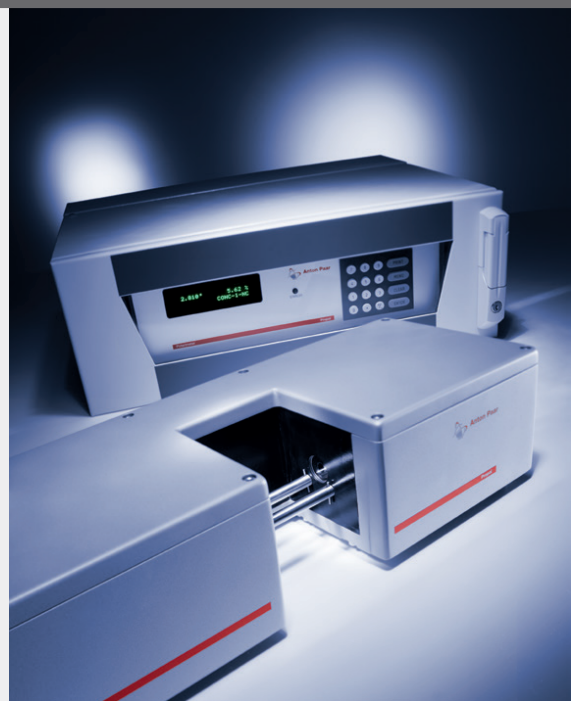
Process Polarimeter: Propol

The Propol process polarimeter allows continuous measurement of optically active substances during production. Without any moving parts, the instrument is free of wear. Its sturdy design is ideal for harsh process environments.

Measuring range:
± 6° OR (Optical Rotation)

Resolution:
0.001° OR (Optical Rotation)

Scales:
Preconfigured concentration
scales and individual scales





Specifications

Refractive Index:

Range: 1.3 nD to 1.72 nD
Accuracy: +/-0.0001 nD
Resolution: +/-0.0001 nD

°Brix:

Range: 0 °Brix to 100 °Brix
Accuracy: 0.05 °Brix
Resolution: 0.01 °Brix

Temperature range:

10 °C to 60 °C

Economy Line Refractometer: Abbemat 200

The Abbemat 200 refractometer makes the Abbemat series' sophisticated measuring technology available to price-sensitive sectors. Offering all essential refractometry features and intuitive handling, Abbemat 200 is a truly universal out-of-the-box solution covering nearly every refractometer application. Dedicated industry solutions are no longer required.

Performance and Performance Plus Line Refractometers: Abbemat 300/350/500/550

The robust Abbemat 300/500 refractometers of the Performance line are ideal solutions for routine analysis and quality control, while the versatile Abbemat 350/550 refractometers of the Performance Plus line are designed for R&D as well as demanding QC applications. Successfully combined with Anton Paar's DMA M density meters, MCP polarimeters and the SVM 3000 Stabinger viscometer, and easily expanded by a wide range of accessories, Abbemat refractometers are readily adapted to a multitude of tasks.

Abbemat 300/350:

Range, RI: 1.26 nD to 1.72 nD
Accuracy: +/-0.0001 nD
Resolution: +/-0.00001 nD

Abbemat 500/550:

Range, RI: 1.30 nD to 1.72 nD
Accuracy: +/-0.00002 nD
Resolution: +/-0.000001 nD



Range, RI:

1.30 nD to 1.72 nD
(Abbemat WR/HT/MW)
1.32 nD to 1.56 nD (Abbemat HP)

Resolution, RI:

1 x 10⁻⁶ nD

Accuracy, RI:

2 x 10⁻⁵ nD (Abbemat HP)
4 x 10⁻⁵ nD (Abbemat WR/HT/MW)

Optional wavelengths:

up to 8 (Abbemat MW)

Heavy Duty Line Refractometers: Abbemat HP/WR/MW/HT

The Heavy Duty Line refractometers are designed for work in harsh environments and for special applications requiring high temperature, multiple wavelengths or vertical operation to avoid sedimentation on the prism. They feature a hermetically sealed stainless steel housing and no display in order to withstand spillage and dirt. The Heavy Duty Line refractometers can be combined with Anton Paar's DMA density meters and MCP polarimeters.

Microviscometer: Lovis 2000 M/ME

The Lovis 2000 M/ME viscometer determines the dynamic, kinematic, relative and intrinsic viscosity of liquids. Due to the small size of its measuring capillaries this new modular viscometer requires only small sample volumes - starting from 100 μL - to deliver results with high precision.

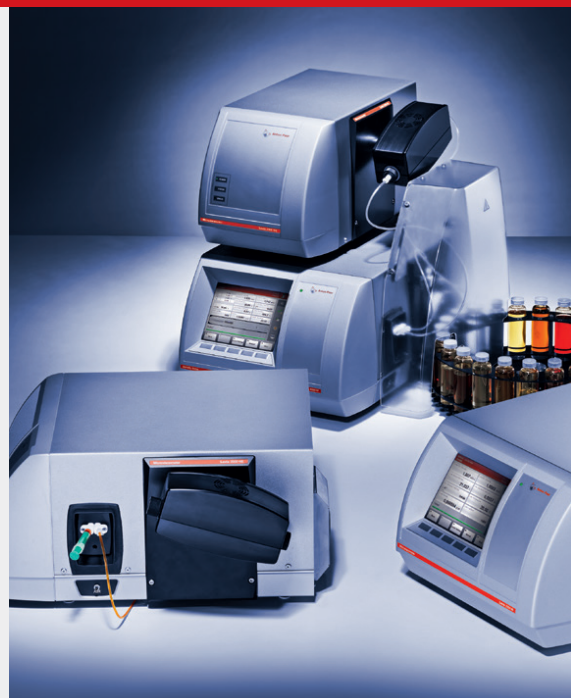
Specifications

Measuring range:
0.3 mPa.s to 10,000 mPa.s
5 °C to 100 °C

Accuracy:
up to 0.5 %

Repeatability s.d.:
up to 0.1 %

Optionally combined with:
DMA Generation M, DSA 5000 M,
Abbatemat refractometers, Alcolyzer
Beer ME, HaccQC ME, pH ME



Measuring range:
0.2 mPa.s to 20,000 mPa.s
0.65 g/cm³ to 3 g/cm³
-56 °C to 105 °C

Reproducibility:
0.35 %

Repeatability:
0.1 %

Minimum sample volume:
2.5 mL

Optionally combined with:
Abbatemat refractometers

Kinematic Viscosity: SVM 3000 Stabinger Viscometer

The SVM 3000 Stabinger Viscometer measures the dynamic viscosity and density of oils and fuels according to ASTM D7042. From this result, the viscometer automatically calculates the kinematic viscosity and delivers measurement results which comply with ISO 3104 or ASTM D445.

Sample Changers: Xsample Series for SVM 3000

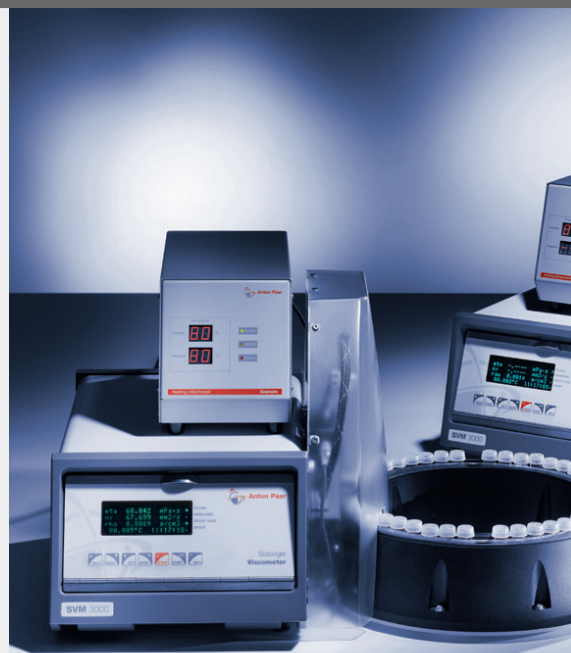
Xsample 361 is designed for single vials, Xsample 460/461 can process up to 96 samples in one cycle. Xsample 361 and 461 Xpress employ pressure filling to swiftly fill highly viscous samples. The heated sample changers Xsample 360H and 460H fill and measure samples with melting points up to 80 °C.

Required sample volume:
5 mL

Volume of sample vials:
12 mL

Minimum solvent consumption:
2.5 mL

Max. filling viscosity:
1000 mPa.s
(Xpress: 5000 mPa.s)





Specifications

Angular velocity range:
10⁻⁹ rad/s to 314 rad/s

Torque range:
2 nNm to 230 mNm

Angular frequency range:
10⁻⁷ rad/s to 628 rad/s

Normal force:
0.005 N to 50 N

Modular Compact Rheometers: MCR 102, MCR 302, MCR 502

The MCR Modular Compact Rheometer series provides any type or combination of rheological tests, whether in rotational or oscillatory mode, based on the air-bearing-supported synchronous EC motor technology. The rheometers are easily equipped with an extensive range of temperature devices and accessories.

Modular Compact Rheometers: Temperature Devices

Temperature devices for MCR rheometers are available based on liquid-, Peltier-, electrical- and convection temperature control principles, covering diverse heating and cooling requirements in an overall range from -150 °C to 1000 °C. All devices are easily integrated or exchanged and are touch-proof up to the highest temperatures.

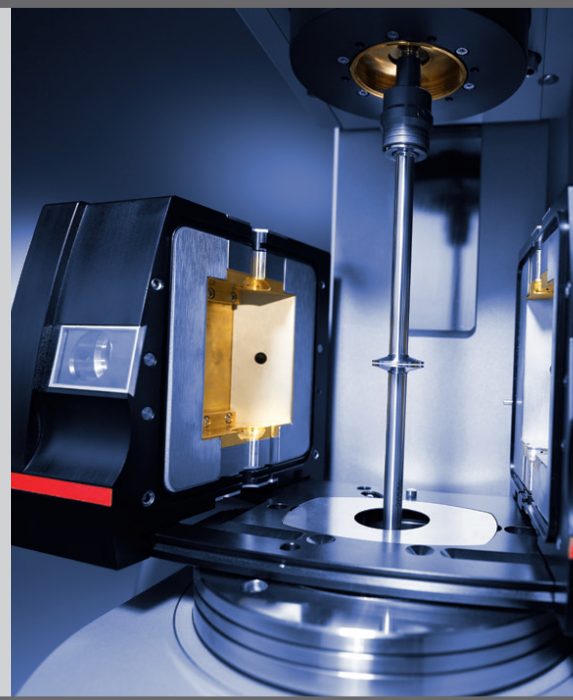
Liquid temperature devices:
-30 °C to 180 °C

Peltier temperature devices:
-40 °C to 200 °C

Electrical temperature devices:
-130 °C to 400 °C

Convection temperature devices:
-150 °C to 1000 °C

Furnace rheometer system:
up to 1600 °C



Modular Compact Rheometers: Accessories for Additional Parameters

A wide range of application-specific accessories is available for easy integration into MCR rheometers, enabling additional parameter setting, optical and dielectric sample structure analysis combined with rheology as well as the transfer of MCR rheometers' capabilities into other material characterization applications.

Example applications:
Magnetorheology
Electrorheology
Rheo-SALS/SAXS/SANS
Particle Image Velocimetry
Dielectric Spectroscopy
Extensional Rheology
Interfacial Rheology
Tribology
Pressure
UV curing



QC Rheometer: RheolabQC

RheolabQC is a rotational quality control rheometer with a powerful, dynamic EC motor drive for fast and convenient viscosity measurement and routine rheological checks. The instrument is used for investigations into the flow and deformation behavior of emulsions, dispersions, coatings, gels and pastes. RheolabQC can be operated in controlled shear rate (CSR) and controlled shear stress (CSS) mode.

Specifications

- Speed range:**
0.01 1/min to 1200 1/min
- Torque range:**
0.25 mNm to 75 mNm
- Viscosity range:**
1 mPa.s to 10^9 mPa.s
- Temperature range:**
-20 °C to 180 °C



Automatic Sample Changer: ASC

- 16 or 32 positions
- Air-bearing drives
- Ball-bearing drives
- Concentric-cylinder systems
- Disposable systems
- Customized cleaning
- LIMS/SAP interface

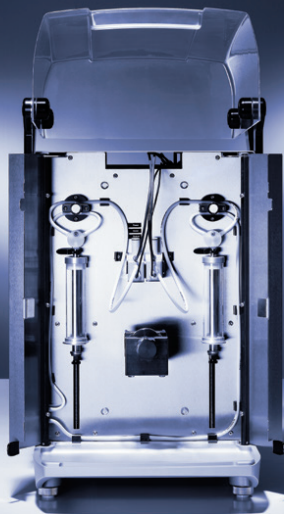
The ASC Automatic Sample Changer for MCR rheometers and RheolabQC allows the fully automated measurement of up to 32 samples in one run, including the cleaning of the measuring system. Single measurements as well as full rheological characterizations are carried out with laboratory quality and precision.

High-Throughput Rheometer: HTR

The HTR is the first fully automated rheometer available. It combines the advantages of high-throughput screening with the reliability of an MCR rheometer. The complete automation of the entire measuring procedure from sample loading to data evaluation is customized to fit individual needs.

- Customized solution:**
- 24/7 operation
- MCR series rheometer
- RheoPlus software
- Joblist editor software
- Robotic cell
- 6-axis robot arm
- Bar code reader
- LIMS/SAP interface





Specifications

Planar solids:
55 mm x 25 mm,
thickness < 30 mm,
20 mm x 10 mm, thickness < 2 mm,
disks with 14 mm and 15 mm
diameter

Fibers:
Min. weight 300 mg

Powders:
Min. particle size 25 μ m

Electrokinetic Analyzer: SurPASS

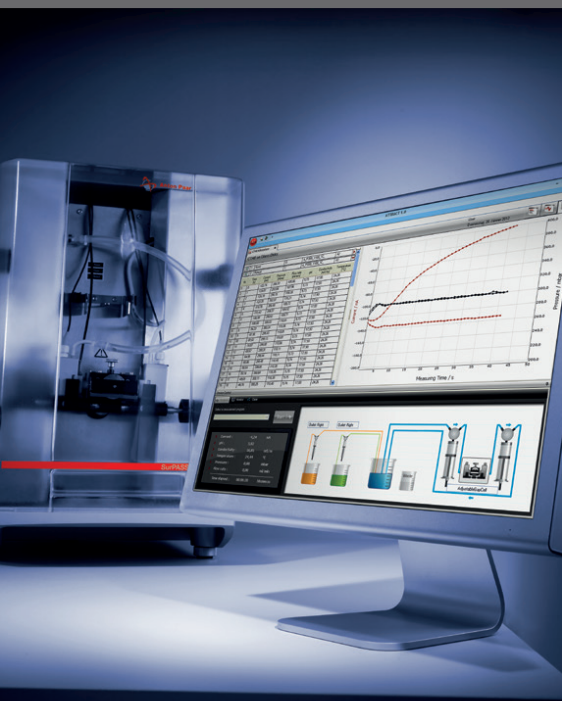
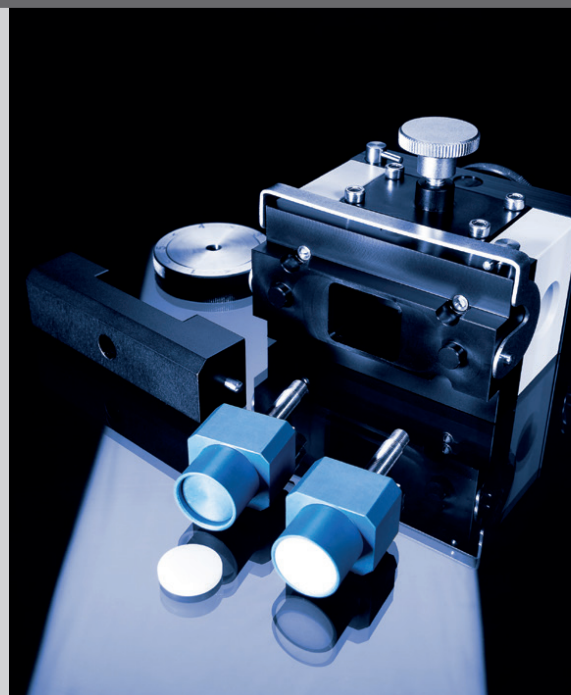
The SurPASS electrokinetic analyzer is used in surface analysis to investigate the zeta potential of macroscopic solids based on a streaming potential and streaming current measurement. It provides information on surface charge and related properties and detects the smallest changes in the surface properties.

For Solids of Various Shape: Cylindrical Cell

The Cylindrical Cell is used for the investigation of natural or technical fibers and fabrics, granular samples and coarse particles.

Recommended for:

Membranes and filters
Biomaterials
Semiconductors
Fibers, fabrics and nonwovens
Cosmetics and detergents
Minerals



Visualization of Adsorption Processes: Attract Software

Recommended for:

Surfactants
Proteins
Polyelectrolytes
Polypeptides
Polysaccharides

In combination with the new software Attract, the applicability of the SurPASS solid surface analyzer is extended to study adsorption and desorption processes on real material surfaces.

Microwave Reaction System for Synthesis: Multiwave PRO

Multiwave PRO covers synthesis applications from the milligram to the multigram scale in chemical laboratories.

For special needs in parallel synthesis, a family of high-throughput rotors in plate format is available, as well as high-performance scale-up rotors.

Specifications

Number of vessels:
up to 192 (depending on rotor)

Max. operating temperature:
300 °C

Max. operating pressure:
80 bar

Microwave output power:
1500 W



Reaction volume:
0.5 mL to 20 mL

Max. IR temperature:
300 °C

Max. fiber-optic temperature:
300 °C

Max. operating pressure:
30 bar

Monomode Synthesis Reactor: Monowave 300

Monowave 300 is a high-performance monomode microwave reactor specially designed for small-scale microwave synthesis applications in R&D laboratories. The optional combination of Monowave 300 with the MAS 24 autosampler allows for unattended sequential processing of 24 experiments.

Multimode Synthesis Reactor: Masterwave BTR

The Masterwave Benchtop Reactor is the first instrument to transfer microwave synthesis to the kilolab, enabling the processing of kilogram amounts per day. With its rising-sensor temperature measurement, Masterwave BTR features the temperature accuracy required for direct method transfer from any smaller microwave device.

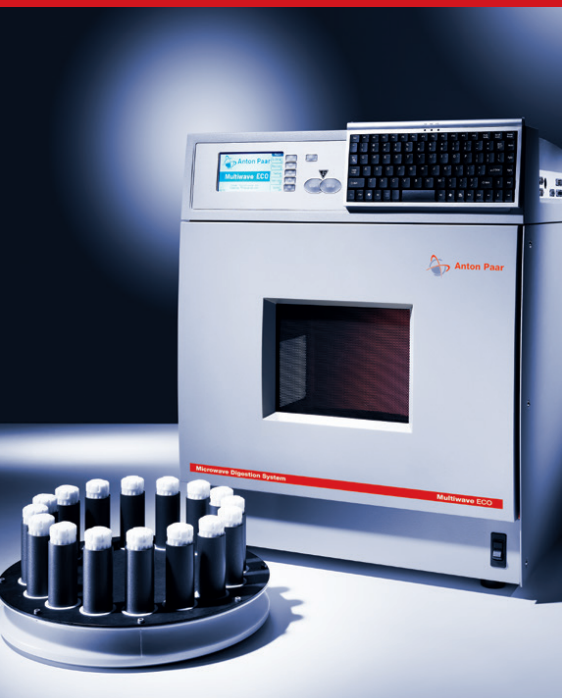
Reaction volume:
250 mL to 750 mL

Max. operating temperature:
250 °C

Max. operating pressure:
30 bar

Microwave output power:
1700 W





Specifications

Number of vessels:
up to 64 (depending on rotor)

Max. operating temperature:
250 °C

Max. operating pressure:
35 bar

Microwave Digestion System: Multiwave ECO

Multiwave ECO is an easily operated and quick acid digestion system for routine analysis of environmental, food and feed samples. With the 16HVT50 rotor, the system sets new standards in heating and cooling efficiency as well as convenient handling. Pressure-activated venting allows for trouble-free digestions of superior quality.

Microwave Reaction System: Multiwave PRO

Multiwave PRO is the champion of sample preparation methods. Its large number of rotors and accessories allows acid digestion, leaching, solvent extraction, oxygen combustion, drying and more. The system is easily and safely operated and ready for the most demanding applications.

Number of vessels:
up to 64 (depending on rotor)

Max. operating temperature:
300 °C

Max. operating pressure:
80 bar

Microwave output power:
1500 W



High Pressure Digestion: HPA-S

The HPA-S provides wet-chemical high-pressure digestion sample preparation for AAS, ICP and voltammetry.

The HPA-S acid digestion method is an internationally recognized reference procedure and is in operation as a high-performance routine instrument in numerous laboratories.

Number of vessels:
up to 21

Max. operating temperature:
320 °C

Max. operating pressure:
130 bar



Nanostructure Analysis: SAXSpace

SAXSpace is a modular analyzer of nanostructures in proteins, foods, pharmaceuticals, polymers and nano-composites, nanoparticles, catalysts and more based on small- and wide-angle X-ray scattering (SAXS/WAXS). The versatile, user-friendly modular system enables high-throughput screening of liquids (Bio-SAXS) and provides precise sample stages for solids (GI-SAXS, tensile- and humidity-dependent SAXS studies).

Specifications

Samples:

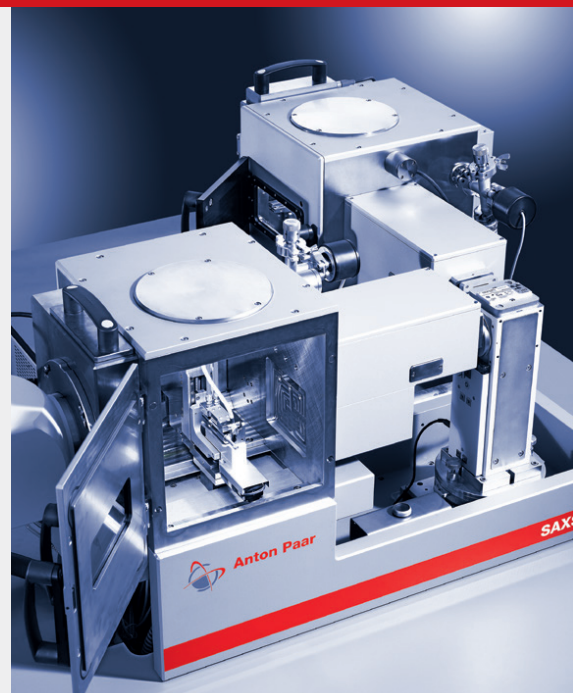
Liquids, solids, powders, foils, fibers, pastes, nanostructured surfaces

Particle size, sample volume:

up to 100 nm (200 nm d-spacing), min. 10 μ L

Temperature range:

-150 °C to 300 °C



Stagemaster:

Integrated XYZ stage for sample mapping and autosampling of solids with automatic detection of all sample stages

Sample holders for TC stage:

Paste Cell, μ -Cell, Rotor Cell, Flow Cell for almost all sample types

GI-SAXS stage:

Precision stage for GI-SAXS studies of solid samples (large specimens)

Tensile stage and Humidity Cell:

SWAXS studies under controlled humidity or tensile stress

Versatile Sample Stages: Full Experimental Flexibility

Dedicated sample stages and holders for SAXSpace give users limitless possibilities. The TC stages provide reliable temperature control from -150 °C to 300 °C. SAXSpace's large sample chamber enables GI-SAXS studies of nanostructured surfaces as well as SAXS studies under controlled tensile stress or controlled atmosphere (e.g. humidity). In this way, advanced SAXS users benefit from full experimental flexibility.

More Beams, More Results: SmartSAXS

SAXSpace offers users the choice of differently collimated beams for increased productivity and a wider range of SWAXS applications.

Multiple SAXSpace beam lines can be simultaneously and independently operated with a single source, enabling diverse SWAXS applications without any setup change.

SmartSAXS feature:

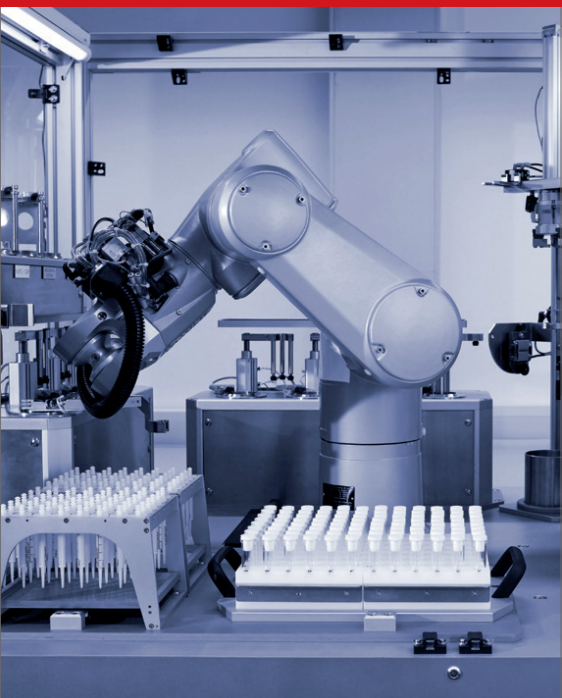
Line- and/or point collimation for all SWAXS applications

Multiple beam lines:

up to four beam lines optionally operated with one X-ray source



Custom-tailored Automation for Analytical Workflows



Specifications

Concept phase:

Based on the workflow assessment and the requirement specifications, an engineering concept is developed.

Implementation phase:

According to this concept, an automation solution is developed, assembled, tested and installed at the customer.

Customized Solutions

Anton Paar offers tailor-made automation and robotics for determining the physical and chemical properties of liquids, pastes and melts.

These individual solutions for complete automated analytical workflows include formulation, preparation, handling, multiple analyses and cleaning of samples.

Combining in-depth application knowledge with robotic engineering expertise, an interdisciplinary team accompanies all projects from concept to implementation.

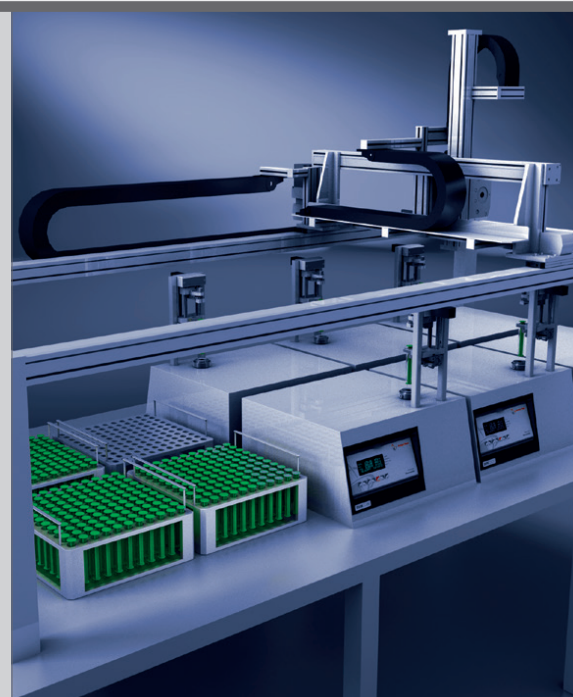
Robotic Platform for Analytical Automation

The platform comprises a Cartesian robot, multiple analytical instruments, a sample storage rack as well as automatic filling and cleaning units for each instrument. Using this robotic platform, large numbers of samples are analyzed fully automatically.

The flexibility of the platform allows the integration of different measuring instruments and facilitates various sample preparation processes.

Integrated instruments:

Viscometer
Density meter
Colorimeter
Titration
Particle count detector
Mass spectrometer
Infrared spectrometer



Automated Sub-sampling Workstation

Throughput of up to 3500 samples per day

Unattended operation

LIMS connection

Integration of measuring instruments

This customized sample preparation solution volumetrically dispenses samples from bottles into corresponding vials. Comprising a Cartesian robot, a vertical storage lifting system and a robotic capping and dispensing tool, this workstation automates the preparation of a large number of samples – and seamlessly fits into existing analytical processes.

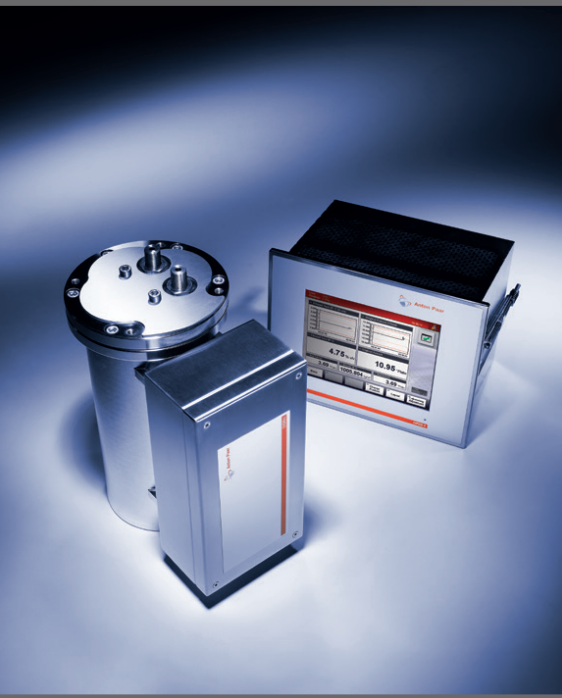
Online/Inline Beverage Analyzer: Cobrix 5

Cobrix 5 is used in beer, wine and soft drinks production, also for soft drinks with sugar inversion. It measures °Brix, % Diet, CO₂, alcohol, original extract, real extract, apparent extract, degree of fermentation and other optional parameters. It is constructed to EHEDG guidelines. A bypass version is also available.

Specifications

Accuracy:

< 0.02 °Brix
(range: 0 °Brix to 50 °Brix)
< 1 % Diet drinks
0.025 vol. (0.05 g/L) CO₂
0.04 %w/w alcohol
(range: 0 %w/w to 16 %w/w alcohol)



Accuracy / repeatability:

Alcohol: 0.02 %w/w / 0.01 %w/w
Real extract:
0.02 °Plato / 0.01 °Plato
Original extract:
0.04 °Plato / 0.01 °Plato
CO₂: 0.05 g/L / 0.01 g/L
0.025 vol. / 0.005 vol.

Inline Beer Measurement: Beer Monitor

The Beer Monitor continuously monitors the alcohol content, apparent and real extract, original extract, degree of fermentation, density, CO₂ and temperature of beer, alcoholic mixtures, and non-alcoholic beer.

Inline Wine Measurement: Wine Monitor

The Wine Monitor determines the alcohol, extract and CO₂ content of wine for quality control and wine blending.

Accuracy / repeatability:

Alcohol: 0.04 %w/w / 0.02 %w/w
Extract: 0.4 g/L / 0.2 g/L
CO₂: 0.05 g/L / 0.01 g/L
0.025 vol. / 0.005 vol.





Specifications

Measuring range:
0 g/L to 20 g/L (0 vol. to 10 vol.)

Accuracy:
0.05 g/L (0.025 vol.)

Repeatability:
0.01 g/L (0.005 vol.)

Measuring time:
15 seconds

Inline CO₂ Sensor: Carbo 510

Carbo 510 is an inline CO₂ sensor which continuously monitors the CO₂ content of beverages. It has a hygienic design, constructed according to EHEDG guidelines. The display can be positioned at a distance of up to 250 meters from the installed sensor.

Process Evaluation Unit: mPDS 5

The mPDS 5 evaluation unit is required for all online/inline density and concentration measurements with process sensors.

The Anton Paar mPDS 5 continuously converts the raw values from the sensors into density and application-specific concentration results. Numerous user programs are integrated. Modern field bus interfaces meet the current requirements of the process industry.

Intuitive operation via 8.4" color touchscreen

Various screen layouts with graphical and numerical output fields

Limit monitoring on the screen and via digital outputs

999 different products

Ethernet (LAN) interface to Davis PC software

Various field bus interfaces



Data Acquisition Software: Davis 5

Remote access via Ethernet

Display of trends and statistics

Statistics report

Product-specific target limits and alarms for up to 999 products

Simple adjustment of measurement values

LIMS connectivity

Davis 5 continuously records all sensor-specific and product-specific data which are determined by the mPDS 5 evaluation unit. The modern interface design of the software makes it intuitive and extremely easy to use.

Inline Viscometer: L-Vis 510

L-Vis 510 is an inline viscometer which is immersed directly in the production liquid. It continuously displays the viscosity and temperature of lubricants, starch adhesives, suspensions and many more process liquids, allowing 24-hour production monitoring.

Specifications

Measuring range:
1 mPa.s to 50,000 mPa.s

Typical accuracy:
1 %

Typical repeatability:
0.5 %

Sample temperature range:
-5 °C to 200 °C



Process Density Sensors

Example applications:

- Food and beverages
- Pharmaceuticals
- Oil and gas
- Petrochemicals
- Chemicals
- Metallurgy and mining

Anton Paar's series of density sensors are used for the measurement of liquids, aggressive liquids, liquids with high temperatures or whenever the highest accuracy is needed. They continuously measure density, concentration or API gravity to optimize production processes and ensure a consistently high quality of product.

Process Sound Velocity Sensors

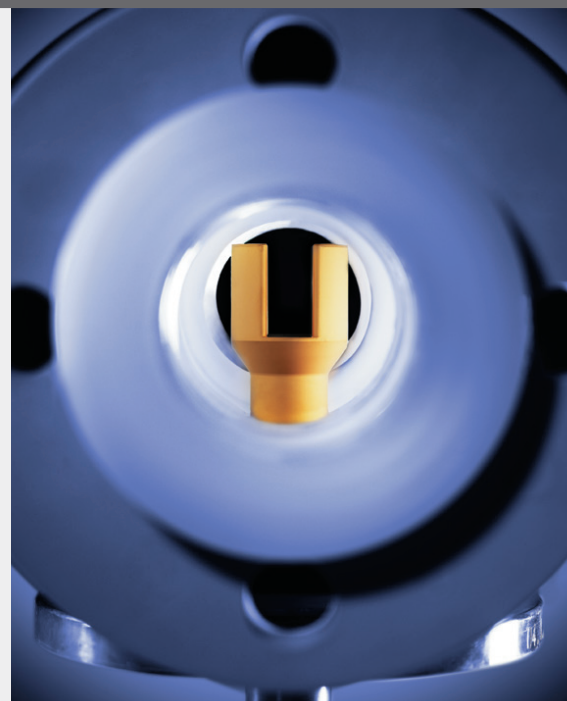
Anton Paar's sound velocity sensors are used for inline concentration measurements, phase separation or product identification. Depending on the sensor, the concentration is either calculated and displayed by an mPDS evaluation unit or calculated by the sensor and provided as a 4-20 mA signal. Sensors are available for aggressive and corrosive liquids and for low flow rates.

Example applications:

Concentration measurement of acids, bases, solvents, worts, chemicals, coolants, foods, etc.

Inline measurement of liquid purity

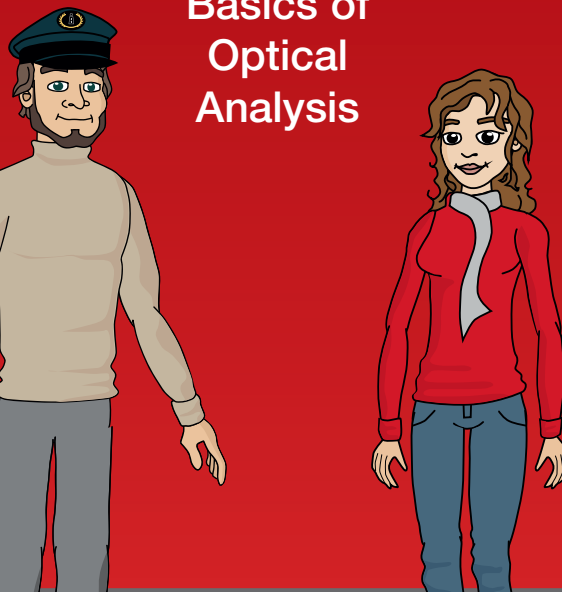
Inline detection of liquid interfaces



Basic Physics: Know-how for Everyone

Anton Paar eLearning Course

Basics of Optical Analysis



Specifications

Topics presented in “Basics of Optical Analysis”:

Color measurement
Turbidity measurement
Refractometry
Polarimetry
Spectroscopic measurements of alcohol and CO₂ content
Oxygen content measurement

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eLearning Course on Optical Analysis Methods

Anton Paar offers a range of entertaining interactive eLearning courses on basic physics. The courses are free of charge and can be ordered from the company’s website.

In the eLearning course “Basics of Optical Analysis”, animated course guides Elektra Spektra and Ray meet on the “Isle of Light” to discuss the basic nature of light. Learners are introduced to different light phenomena and how these help measure materials.

eLearning Courses on Density and CO₂ Measurement

In “Basics of Density Measurement”, animated course guide Dr. Daphne Density introduces eLearners to density and concentration measurement, compares various measuring methods and investigates important applications.

In “Basics of CO₂ Measurement”, Dr. Greta Carbo from the Bubbly Beverage Institute gives eLearners a fresh perspective on the determination of dissolved CO₂ in beverages.

Topics presented in “Basics of Density Measurement”:

Applications, comparison of measuring methods, oscillating U-tube principle, concentration determination and more

Topics presented in “Basics of CO₂ Measurement”:

Basic gas laws, Multiple Volume Expansion method, laboratory and online determination of dissolved CO₂

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Anton Paar
eLearning Course

Basics of CO₂ Measurement



Anton Paar
eLearning Course

Basics of Rheometry



Topics presented in “Basics of Viscometry”

Shear viscosity, kinematic viscosity, methods for determining liquids’ viscosities, Stabinger viscometry

Topics presented in “Basics of Rheometry” courses

Viscosity and elasticity of materials, flow and deformation behavior, test descriptions and application examples: food, paints and coatings, asphalt and more

Order at:

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eLearning Courses on Viscometry and Rheometry

Join animated course guide Joe Flow, a practically oriented expert of viscometry and rheometry, in a tour of Rheology Road that spans three courses: “Basics of Viscometry”, “Basics of Rheometry: Rotation” and “Basics of Rheometry: Oscillation”.

From the viscosity of petroleum and the flow behavior of toothpaste to the elasticity of asphalt slivers: In all three courses, eLearners see everyday materials in an entirely new light.

