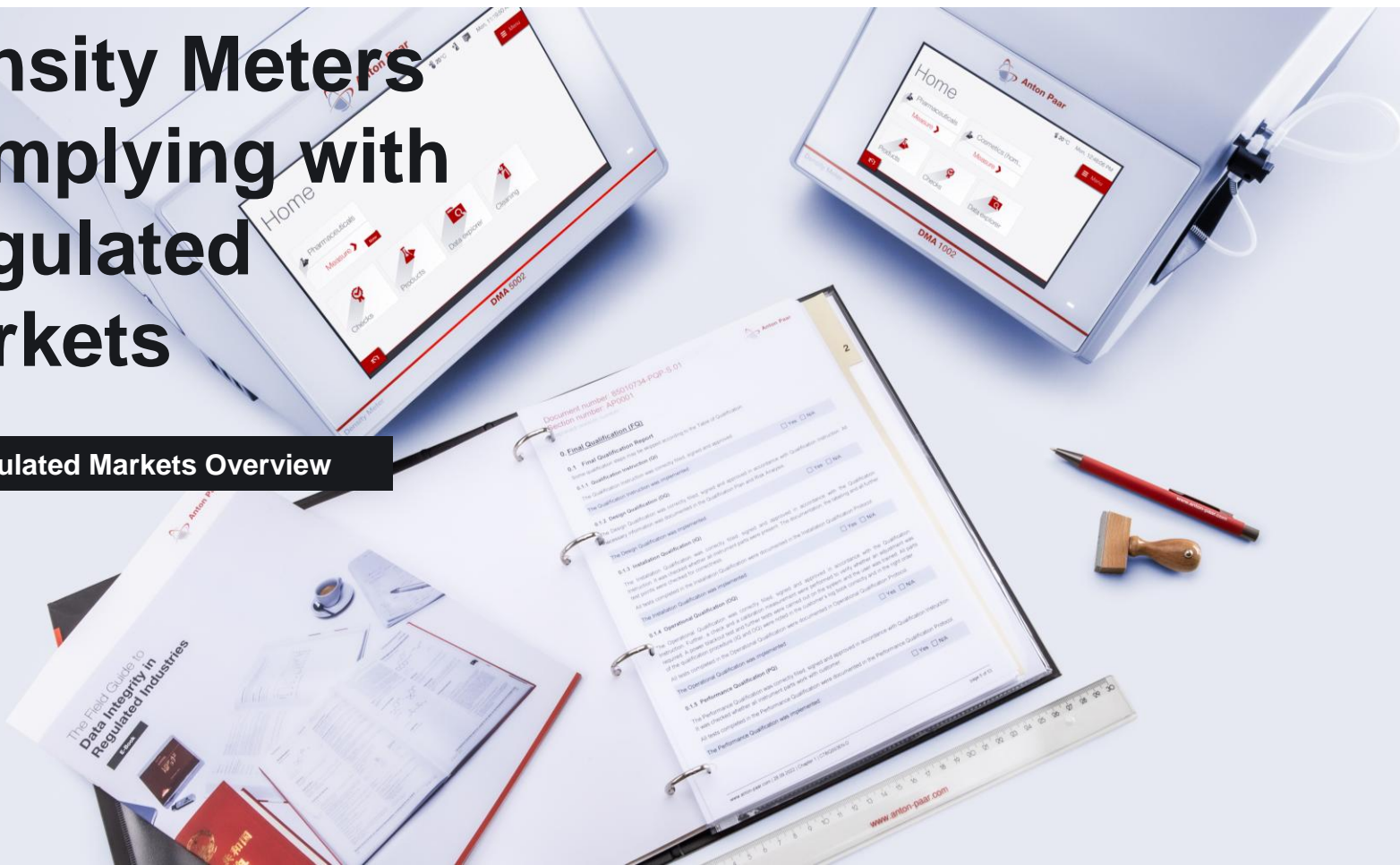


# Density Meters Complying with Regulated Markets

Regulated Markets Overview



# Laboratory Analysis

**Boost quality and compliance with our cutting-edge density measurement solutions. Engineered for precision and data integrity, they empower your production to excel in today's competitive, highly-regulated market**



## **Trusted expertise for more than 55 years**

Customers around the world trust the DMA density meter. Quality control managers across every industry for big and small companies rely on them everywhere. They all know that more than five decades of partnership and application expertise guarantee reliable measurement.



## **Market-leading analysis. Full process coverage**

Density measurement is essential for maintaining quality standards in the pharmaceutical and life-science industry. Formulating APIs, developing drug delivery systems, or ensuring precise dosages: our instruments deliver the accuracy you need. Providing market-leading analysis across the entire production process, we ensure reliability and precision at every step.



## **85+ service stations and a three-year warranty**

Anton Paar instruments are famously durable but if support is required a global service network expert is on location within 24 hours, speaking the local language. And every time a new instrument generation is launched, spare parts for predecessor instruments are guaranteed for at least 10 years.

# Laboratory Analysis



## **Trust in Data. Confidence in Audits.**

Ensure all data is linked to users, timestamps, and actions for complete traceability. Maintain clear, readable, and accessible records in standardized formats. Record measurements immediately and securely to guarantee accuracy and timeliness. Protect original data with secure storage, unaltered raw records, and detailed audit trails. Strengthen data security with role-based access controls and electronic signatures for accountability.



## **Accelerated Qualification. Verified Performance.**

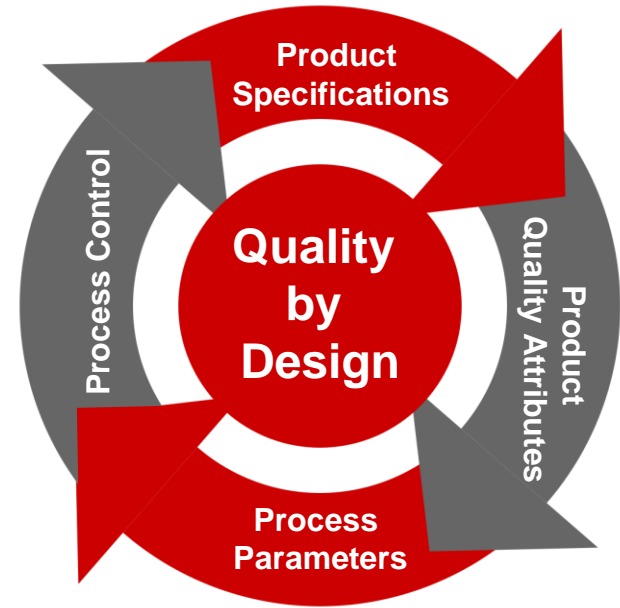
Use AISQ+ documents to meet regulations efficiently. Follow expert guidance to complete the qualification process quickly and accurately. Customize templates to align with your internal procedures and compliance needs. With certified reference materials, Anton Paar ensures precise performance verification and fully documented, GMP-compliant processes from installation to audit.



## **Data Management with AP Connect**

Streamline your workflows with seamless integration and centralized data management. Enhance efficiency through automated data transfer and error reduction. Ensure compliance with secure storage and traceable measurement records. Access data anytime, anywhere with cloud-based connectivity features.

# Quality by Design (QbD) Anton Paar Solutions



## Comprehensive process understanding

- Gain insights into critical quality attributes (CQAs) like density, viscosity, and concentration with precise, reliable instruments
- Control and optimize production processes based on real-time data.

## Integrated data solutions

- AP Connect provides seamless data integration, traceability, and compliance with 21 CFR part 11.
- Centralize quality data for easy tracking, analysis, and reporting across production.

## Support for Process Analytical Technology (PAT)

- Measurement options allow for real-time process control, embedding quality into manufacturing.
- Facilitate proactive adjustments with continuous data from PAT frameworks.

## Regulatory compliance and traceability

- Ensure secure, traceable data management meeting regulations.
- Integrated solutions help manufacturers achieve QbD compliance, reduce waste, and maintain high standards for product quality.

# Market-Leading Density Solutions for Regulated Industries

Density determination of pharmaceutical substances in 100+ monographs and concentration tables for 140+ chemicals

US Pharmacopeia <841>

Specific gravity



Japanese Pharmacopeia 2.56

Determination of specific gravity and density

European Pharmacopoeia

2.2.5

Relative density



Chinese Pharmacopeia 0601

Determination of relative density

Concentration table for 140+ chemicals



# Safe. Traceable. Compliant.

Benefits and features of Anton Paar density meters relevant for regulated industries

## FillingCheck™

Ensure homogeneous and correct sample filling

## U-View™

Image of the U-tube included in the measurement report

## U-Dry

Easy contactless cleaning of the U-tube

- System security
- User and role management
- Electronic signature
- Automatic audit trail
- Centralized data hub with AP Connect



# Powering Potential

Measure Everything, Everywhere  
With portable and compact density meters

## DMA 35

3-digit portable  
density meter



Accuracy: 0.001 g/cm<sup>3</sup>

- Results from a 2 mL sample in seconds
- One device to replace all glass hydrometers and pycnometers in the workplace
- Fast sample processing with an RFID interface and Bluetooth® capability
- Fermentation monitoring including visualization
- Intrinsically safe device
- Lightweight
- No active temperature control required

## DMA 502, DMA 1002

Advanced 3- and 4-  
digit density meters



Accuracy: DMA 502: 0.001 g/cm<sup>3</sup>  
DMA 1002: 0.0001 g/cm<sup>3</sup>

- U-Pulse, U-View™, FillingCheck™
- One-touch measurement
- Filling support via Xsample 200 or a funnel
- Equipped with more than 140 concentration tables
- Rugged, splash-proof design for the toughest conditions

# Powering Potential

## Best-in-Class Performance

Modular benchtop density meters and combined density and sound velocity meters



**DMA 4002, DMA 5002,  
DMA 6002**

**Modular benchtop  
density meters**

Accuracy:

DMA 4002: 0.00005 g/cm<sup>3</sup>

DMA 5002: 0.00001 g/cm<sup>3</sup>

DMA 6002: 0.000005 g/cm<sup>3</sup>

- U-Pulse, U-Dry, U-View
- One-touch measurement
- Syringe and status light
- Modular extendable
- Full automation via Xsample series
- Results with four-digit accuracy in 20 s (or up to six-digit accuracy for even higher precision)
- Technology that's been in the field for 40+ years



**DMA 6002 Sound Velocity**

**Combined density meter  
and sound velocity meter**

Accuracy:

- Density: 0.000005 g/cm<sup>3</sup>

Repeatability:

- Sound velocity: 0.5 m/s

- U-Pulse, U-Dry, U-View
- One-touch measurement
- Syringe and status light
- Modular extendable
- Full automation via Xsample series
- Simultaneous determination of density and sound velocity



# Powering Potential

**Type-Approved. Trade-Ready. Trusted.**  
Anton Paar density meters with type-approval from  
Physikalisch-Technische Bundesanstalt (PTB)



**DMA 501/1001 EZ with  
type approval**

**Type-approved  
compact density meter**

- Repeatability:  
DMA 501 EZ: 0.0002 g/cm<sup>3</sup>  
DMA 1001 EZ: 0.00005 g/cm<sup>3</sup>  
Max. permissible error:  
DMA 501 EZ: 0.001 g/cm<sup>3</sup>  
DMA 1001 EZ: 0.0005 g/cm<sup>3</sup>
- 25000 measurements
  - 5000 audit trail entries
  - 1000 checks
  - 500 adjustments
  - U-Pulse, U-View™, FillingCheck™
  - Equipped with more than 140 concentration tables
  - Rugged, splash-proof design for the toughest conditions

**Ensure legal compliance, market access, and trust and reliability.**  
**Required for commercial transactions, taxation control (e.g. alcohol, fuel) or regulatory compliance**



**DMA 4101/4501/5001 EZ  
with type approval**

**Type-approved modular  
benchtop density meter**

- Repeatability:  
DMA 4101 EZ: 0.00001 g/cm<sup>3</sup>  
DMA 4501 EZ: 0.000005 g/cm<sup>3</sup>  
DMA 5001 EZ: 0.000001 g/cm<sup>3</sup>  
Max. permissible error:  
DMA 4101 EZ: 0.0005 g/cm<sup>3</sup>  
DMA 4501 EZ: 0.0002 g/cm<sup>3</sup>  
DMA 5001 EZ: 0.0001 g/cm<sup>3</sup>
- 60000 measurements
  - 50000 audit trail entries
  - 1000 checks
  - 500 adjustments
  - Welmec compliant
  - U-Pulse, U-View™, FillingCheck™
  - Equipped with more than 140 concentration tables
  - Rugged, splash-proof design for the toughest conditions

# Measurement System

Lovibond PFXi

Konica Minolta CM-5

**Color**

Choose from the following options and primary instruments

- DMA 4002
- DMA 5002
- DMA 6002
- DMA 6002 Sound Velocity

Add your documentation

- IQ|OQ|PQ
- AISQ+



**Viscosity**

Lovis 2001

**Sample changer**

Xsample 3100/3200

Xsample 5100/5200

**Refractive index**

Abbemat 5101

Abbemat 5201

**Optical rotation**

MCP 100

MCP 150

**pH**

pH 3101

pH 3301

**Turbidity**

Haze 3001



### Sample changer

- **Eliminate handling errors and save time with automation**
- **Reduce costs per measurement**

Benefit from a range of automation options. Suitable for various types of samples, finished products, and low and high sample throughputs. We have an automated pre-defined or customized solution to fit your business.



### Refractive index

- **Receive your refractive index simultaneously with density in one automated setup**
- **USP 831 and Ph.Eur. 2.2.6**

The Abbemat Advanced refractometers achieve precise measurements in automated labs and improve efficiency in multiparameter measurement system. Benefit from over 200 pre-installed concentration measurements and short measurement cycles.



### Optical rotation

- **Measure the optical rotation of your sample simultaneously**
- **USP 781 and Ph.Eur. 2.2.7**

The MCP 150 polarimeter is the choice for determining the optical rotation of your API or excipient, being fully compliant with the industry's regulations. With a small footprint, the MCP is ideal for combinations with the DMA or Abbemat. The built-in Peltier temperature control guarantees fast and even temperature distribution.



## Viscosity

- **Dynamic and kinematic viscosity in one measurement cycle**
- **USP 913 and Ph.Eur. 2.2.49**

Combine the DMA with a Lovis 2001 rolling ball viscometer module with adjustable angle and explore high precision measurements especially for low-viscosity or shear-sensitive liquid samples. Fully automatic filling and cleaning is possible in combination with a sample changer.



## pH

- **Simultaneous pH measurement**

Determine pH alongside other quality parameters. With the pH 3101 and pH 3301 electrode, you can measure the pH value of your sample simultaneously.



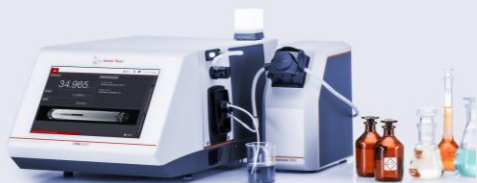
## Turbidity

- **Analyze turbidity in just three minutes**
- **Compliant with official standards**
- **USP 855 and Ph.Eur. 2.2.1**

Add a reliable turbidity analysis to a variety of monitored parameters. A built-in solid state Peltier thermostat guarantees a steady temperature control. The compact turbidity measuring cell minimizes the impact of carry-over effects and rapidly reaches equilibrium.

# Recommended Configurations

Design your measurement system  
one component at a time



**Chemical measurement system**

**DMA 6002 Sound Velocity  
Xsample 3100**



**Turbidity measurement system**

**DMA 5002  
Haze 3001  
Xsample 5100**



**Pharma measurement system**

**DMA 5002/6002  
Abbemat 5101/5201  
Lovis 2001  
Xsample 3200/530**



**Flavor & Fragrance meas. system**

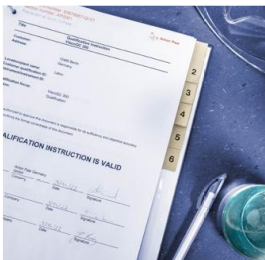
**DMA 5002  
Abbemat 5101  
MCP 150  
Xsample 530  
+ Optional Colorimeter Lovibond  
PFXi or Konica Minolta CM-5**



[Click here for more configurations](#)

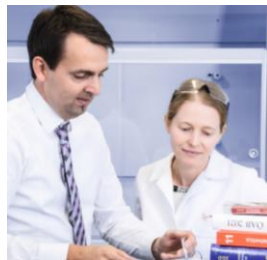
# Qualification packages and services

## Qualified along the instrument life cycle



### **AISQ+** Analytical Instruments and System Qualification Plus

Achieve compliance with AISQ+ and deliver accurate, repeatable measurements tailored to your needs. Streamline data integration by connection to LIMS for an automated data flow. With AISQ+ you are fully compliant to FDA, ISO, and GMP requirements.



### **AISQr** Analytical Instruments and System Qualification Requalification

Validate your setup to ensure measurement reliability. Maintain compliance even after a relocation or system updates. Benefit from support from Anton Paar specialists to complete the qualification seamlessly.

## Guaranteed data integrity



### **CPM** Compliant Preventive Maintenance

Keep your instruments aligned with industry regulations and audit-ready. Avoid costly downtime with regular inspections and proactive servicing. Maintain consistent high-quality results over the lifecycle of your equipment.



### **IQ|OQ|PQ** Installation Qualification, Operational Qualification, Performance Qualification

With the paperless IQ|OQ|PQ you achieve compliance with regulated markets, where no 21 CFR Part 11 compliance is required, such as the food and cosmetics industry.

# Centralize your data management

## Anton Paar's lab execution software



### AP Connect

Anton Paar's laboratory software solution

Centralized data management

Streamline your lab workflows with AP Connect and benefit from seamless data integration and transfer. Its centralized data management ensures compliance and reduces errors, saving you time and resources.

## Compliant data management



### AP Connect Pharma

Fulfilling industry requirements

Integrated audit-trail

With AP Connect Pharma, you fulfill all requirements of ALCOA++ and CFR 21 Part 11. With the electronic signature feature and the integrated audit trail, you maintain complete transparency and are always audit-ready.

# Reliable. Compliant. Qualified.

[Anton Paar's certified density standards](#) 

AP Density standard Dodecane, 0.750 g/cm<sup>3</sup>  
1x10 mL ISO 17034 certificate

AP Density standard Oil, 0.830 g/cm<sup>3</sup>  
1x10 mL ISO 17034 certificate

AP Density standard Water, 0.998 g/cm<sup>3</sup>  
1x10 mL ISO 17034 certificate

AP Density standard Glucose/Water 10%, 1.040 g/cm<sup>3</sup>  
1x10 mL ISO 17034 certificate

AP Density standard Sodium bromide, 1.250 g/cm<sup>3</sup>  
1x10 mL ISO 17034 certificate

# Calibration Service

**ISO 17025 & ISO 17034: Trust. Truth. Traceability.**

With Anton Paar instruments, you get proven accuracy, precision, and globally recognized ISO 17025 calibration, ensuring traceability to the SI units. This guarantees true, comparable results for authorities and partners worldwide. Need traceable density standards for quality checks? Order ISO 17034-certified standards directly from our webshop.



## Internationally accepted calibrations

ISO 17025 calibration certificates from Anton Paar GmbH are internationally accepted as Akkreditierung Austria is a signatory to the ILAC agreements for mutual recognitions of calibration services.



## ISO 17034-certified reference material

Anton Paar is an internationally acknowledged reference material producer, accredited to ISO 17034. Our density standards are traceable to the International System of Units (SI).



# Find out more about industry-specific solutions

## Chemical industry



## Pharmaceutical & cosmetic industry



## Food industry



## Petroleum industry



**Get in touch**

[www.anton-paar.com](http://www.anton-paar.com)