

Laboratory Refractometers

Abbemat Series



Sign Your Results with **Confidence**

Are you responsible for the quality control of chemical, food, beverage, or pharmaceutical products?

Then the Abbemat refractometer series by Anton Paar will enable you to:

- Assure your company's product quality at all times and minimize corporate risk
- Demonstrate secure data management and compliance at any time
- Characterize your newly developed substances and processes to the limits of what is technologically possible

With the Abbemat refractometer series, you will sign every single one of your results with confidence!

Are you responsible for the efficiency of your lab?

- Simplify workflows
- Keep training efforts low
- Reduce cycle times
- Manage data digitally in your paperless lab

With the Abbemat refractometer, you will match your production demands with QC capacity.



Proven Accuracy

Refractive index traceable to metrological reference standards

Rely on accurate measuring results at all times.

Abbemat refractometers offer unparalleled accuracy and traceability for refractive index (RI) measurements. With a precision of up to ± 0.00002 nD (± 0.015 °Brix), they deliver reliable results across a wide range from 1.26 nD to 1.72 nD.

This is achieved by supreme control of temperature, carefully adjusted wavelength, and use of the most precise calibration standards before the instrument leaves the factory.

All Abbemat refractometers come with a comprehensive set of certificates as proof. Both refractive index and temperature can be verified on-site over the entire life of your instrument.



TEMPERATURE

Abbemat refractometers achieve an unsurpassed surface temperature accuracy of ± 0.03 °C.

The patented T-Check system for factory adjustment, instrument qualification, and preventive maintenance enables proven temperature measurement in full accordance with USP <831> requirements.



WAVELENGTH

Factory wavelength verification eliminates errors from samples with different dispersions, ensuring accurate measurements for all your products.



REFERENCE STANDARDS

Factory calibration is conducted using up to 13 certified reference standards from national metrology institutes (PTB/GUM)*, minimizing uncertainty.

*PTB: Physikalisch-Technische Bundesanstalt (National Metrology Institute, Germany)
GUM: Central Office of Measures, Poland



Boost Efficiency

Refractometers Matching Your Workflows

USER INTERACTION

Minimal training effort

Train only to the extent needed. Configure access for users to avoid unnecessary complexity and sources of error.

Adaptive user interface

Keep your screens as simple as possible for your workflows. Get rid of everything that gets in the way.

RUNNING SAMPLES

Fast application of sample

From pipettes and syringes to beakers and buckets: The Abbemat accessories ensure safe and fast sample handling.

Low sample volume

One drop of sample from your pipette is enough. The optional micro-flow cell enables precise measurements with as little as 70 µL, making the Abbemat refractometers ideal for limited or costly samples.

Rapid concentration checks

Determine concentration directly by selecting one of the 200 pre-installed methods. Replace time-consuming processes like titration.

Short measurement cycles

Enhance your lab efficiency with rapid 10-second measurement cycles, including securely documented results, maximizing your hourly sample throughput.

MULTIPLE PARAMETERS & AUTOMATION

Multiple parameters in one go

Integration with Anton Paar's density meters, viscosity meters, and polarimeters enables automated multiparameter workflows.

Automated measurements

Run up to 57 samples automatically with the Anton Paar Xsample 5100 or 5200 carousel sample changers, and free up time for other tasks.

DATA INTEGRATION

Effortless data handling

From result stickers for your lab book to a fully integrated data storage and management system, the Abbemat series matches your processes.



Abbemat Essential

Cost-Efficient Quality Control

The Abbemat Essential line is budget-friendly with best build quality and temperature control. All three instruments are suitable for liquids; viscous or solid substances; and turbid or dark substances. No training is needed. Efficient use by all staff is ensured.

Benefits

- ✓ Precise Peltier temperature control for all instruments
- ✓ Up to 10 methods: Refractive index and Brix preset, plus eight optional methods
- ✓ High accuracy (up to ± 0.00002 nD)
- ✓ Sapphire prism backed by a 25-year warranty
- ✓ Easy label printing, no error-prone manual data copying

	Abbemat 3001	Abbemat 3101	Abbemat 3201
	↓	↓	↓
Peltier temperature control	20 °C to 40 °C	10 °C to 70 °C	4 °C ¹⁾ to 105 °C
Measuring range	1.33 nD to 1.55 nD 0 °Brix to 100 °Brix	1.30 nD to 1.66 nD 0 °Brix to 100 °Brix	1.26 nD to 1.72 nD 0 °Brix to 100 °Brix
Accuracy ¹⁾	± 0.0001 nD ± 0.05 °Brix	± 0.00004 nD $\pm 0.03^\circ$ Brix	± 0.00002 nD ± 0.015 °Brix
Connectivity	Label printer		
Repeatability	± 0.0001 nD	± 0.0000015 nD	± 0.0000015 nD
Resolution	± 0.0001 nD	± 0.00001 nD	± 0.000001 nD
Temperature probe accuracy ²⁾	± 0.05 °C	± 0.03 °C	± 0.03 °C
Interfaces	7" hybrid touch screen, USB A		

1) At max. ambient temperature of 35 °C
2) Valid at standard conditions (T=20 °C, ambient temperature 20 °C to 25 °C)



FIND OUT MORE



www.anton-paar.com/apb-abbemat-essential

Abbemat Advanced

Networked Quality Control

The Abbemat Advanced line is designed for busy, automated laboratories. These instruments are ideal for handling a broad range of different samples with product-specific workflows and settings. Networked, secure user and data management is available via our lab execution software AP Connect.

Benefits

- ✓ Sample-specific measuring settings save time and avoid errors
- ✓ Customizable touchscreen interface with instant pass/fail feedback based on set limits
- ✓ Over 200 pre-defined methods for fast concentration readings
- ✓ Optional automation: Up to 57 measurements per run with the Xsample 5100 or 5200 sample changers
- ✓ Multiparameter measurements with other Anton Paar instruments



	Abbemat 5001	Abbemat 5101	Abbemat 5201
	↓	↓	↓
Peltier temperature control	20 °C to 40 °C	10 °C to 70 °C	4 °C ¹⁾ to 105 °C
Measuring range	1.33 nD to 1.55 nD 0 °Brix to 100 °Brix	1.30 nD to 1.66 nD 0 °Brix to 100 °Brix	1.26 nD to 1.72 nD 0 °Brix to 100 °Brix
Accuracy ²⁾	±0.0001 nD	±0.00004 nD	±0.00002 nD
Repeatability	±0.0001 nD	±0.0000015 nD	±0.0000015 nD
Resolution	±0.0001 nD	±0.00001 nD	±0.000001 nD
Temperature probe accuracy	±0.05 °C	±0.03 °C	±0.03 °C
Connectivity	Networked data storage, printer, AP Connect, Xsample 5100 and 5200 (autosampler), DMA series (density meter), SVM series (viscometer) and MCP polarimeter		
Interfaces	7" LCD touch screen, Ethernet, 3xUSB A, CAN		
Data storage	10,000 measurements, 400 products		

1) At max. ambient temperature of 35 °C
2) Valid at standard conditions (T=20 °C, ambient temperature 20 °C to 25 °C)

FIND OUT MORE



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apb-abbemat-advanced

Abbemat Pharma

Pass Your Audit with Excellence

The Abbemat Pharma line is perfect for achieving full compliance in the regulated environment.

The instruments are designed to exceed the expectations of pharmaceutical regulations, meeting 21 CFR Part 11, GAMP 5, and EU GMP Vol. 4 Annex 11. They provide secure data management, audit trails, electronic signatures, and access control. With secure storage and access to measuring data and metadata, you are audit-ready at all times.

The AISQ+ qualification package speeds up validation by 70 %, offering risk analysis, SOPs, and traceability documentation for quick deployment in regulated environments.

Benefits

- ✓ Audit trail for comprehensive event logging, with filter function
- ✓ Advanced user management with unique IDs, password protection, and e-signatures for secure, traceable access
- ✓ Error prevention via sample-specific measuring settings that cannot be altered by operator
- ✓ Customizable touchscreen interface with instant pass/fail feedback based on set limits
- ✓ Optional automation: Up to 57 measurements per run with Xsample 5100 or 5200
- ✓ Multiparameter measurements with other Anton Paar instruments

	Abbemat 7001	Abbemat 7201
Peltier temperature control	↓ 20 °C to 40 °C	↓ 4 °C ¹⁾ to 105 °C
Measuring range	1.33 nD to 1.55 nD 0 °Brix to 100 °Brix	1.26 nD to 1.72 nD 0 °Brix to 100 °Brix
Accuracy ²⁾	±0.0001 nD	±0.00002 nD
Repeatability	±0.0001 nD	±0.0000015 nD
Resolution	±0.0001 nD	±0.000001 nD
Temperature probe accuracy	±0.05 °C	±0.03 °C
Connectivity	Networked data storage, printer, AP Connect, Xsample 5100 and 5200 (autosampler), DMA series (density meter), SVM series (viscometer) and MCP polarimeter	
Interfaces	7" LCD touch screen, Ethernet, 3xUSB A, CAN	
Data storage	10,000 measurements, 400 products	

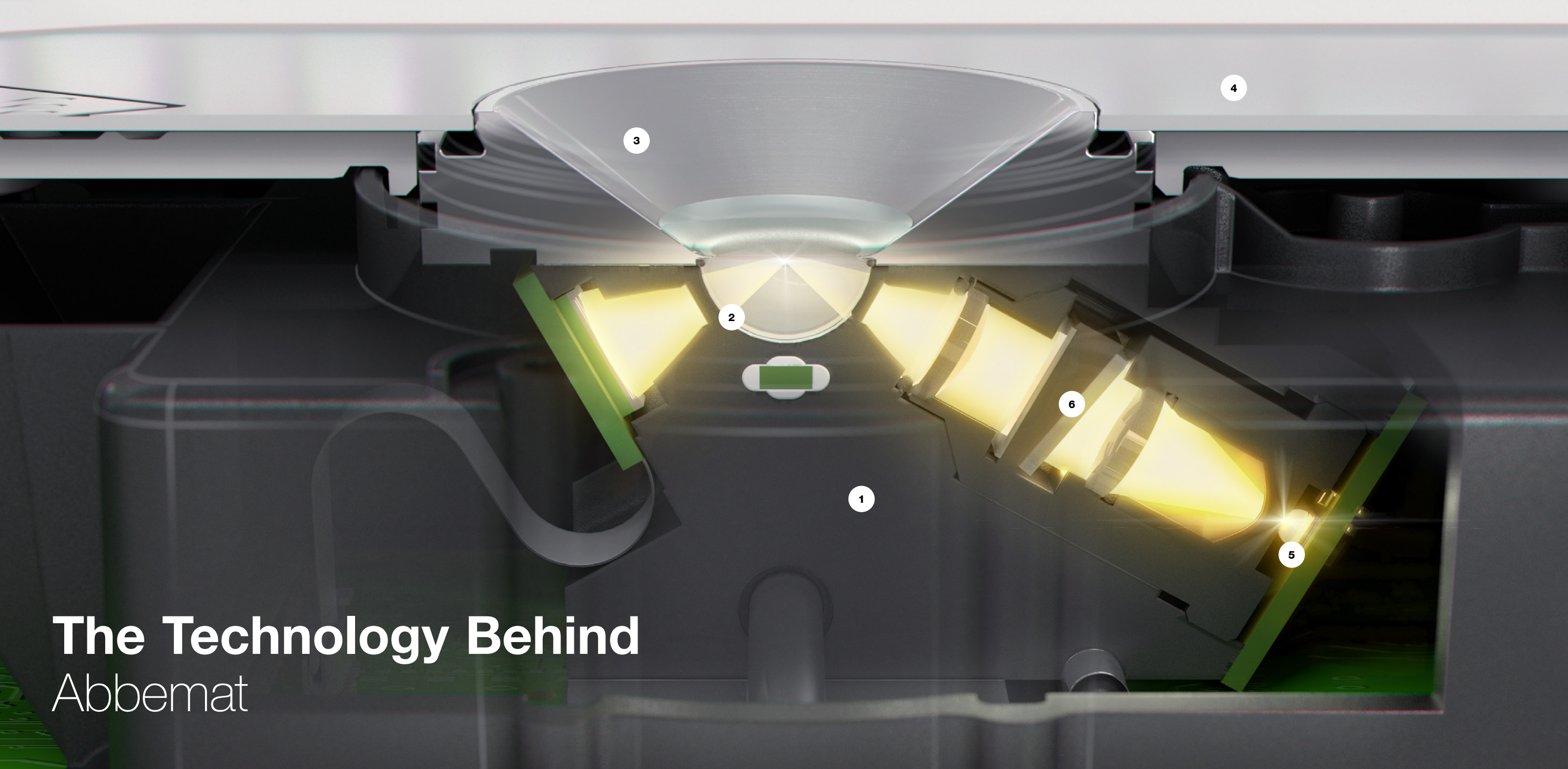
1) At max. ambient temperature of 35 °C
2) Valid at standard conditions (T=20 °C, ambient temperature 20 °C to 25 °C)



FIND OUT MORE



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The Technology Behind Abbemat

1. Proven temperature control

- Most precise prism-surface temperature measurement
- Temperature accuracy verified, documented, and traceable with patented Anton Paar T-Check

2. Scratch-proof sapphire prism

- Resists cleaning with spatula or other lab tools
- Mohs hardness of 9, close to diamond
- 25-year warranty on the sapphire prism

3. Stainless steel sample well

- Resistant to most chemicals
- Smooth and easy to clean
- Hastelloy option for strong acids such as nitric- and sulfuric acid

4. Protective dripping plate

- Reduces risk of damage by spilled liquids
- Made of resistant stainless steel
- Securely held in place by magnets
- Easily removed for cleaning

5. Long-life LED light source

- Average lifetime of 100,000 hours for continuous 24/7 operation

6. Wavelength

- Optical filters precisely tuned to 589 nm to ensure results of ± 0.00002 nD* independent of dispersion of the sample

*Valid at standard conditions (T=20 °C, ambient temperature of 20 °C to 25 °C)

A Solution for Every Challenge



SAMPLE COVER (INCLUDED)

For volatile samples

- Prevents evaporation of volatile samples
- Ensures stable readings even with solvents like ethanol



FLOW CELL

For small volumes or hazardous samples

- Requires only 70 μ L microliters of sample
- Minimizes contact with hazardous materials
- Automated measurements with sample changer or multiparameter measurement systems



FILLING FUNNEL

For large sample volumes

- Ideal for samples in beakers or canisters



SAMPLE PRESSER

For foils or flat solids

- Ensures reproducible results via optimal contact between sample and measuring prism

Abbemat refractometers support a range of optional add-ons and extensions – from flow cells to sample changers – to simplify handling of small, volatile, or hazardous samples, enable automation, and integrate multiparameter analysis.



PROTECTION COVER

For harsh environments

- Keeps the instrument clean even in rough conditions



PHARMA QUALIFICATION**

For the regulated environment

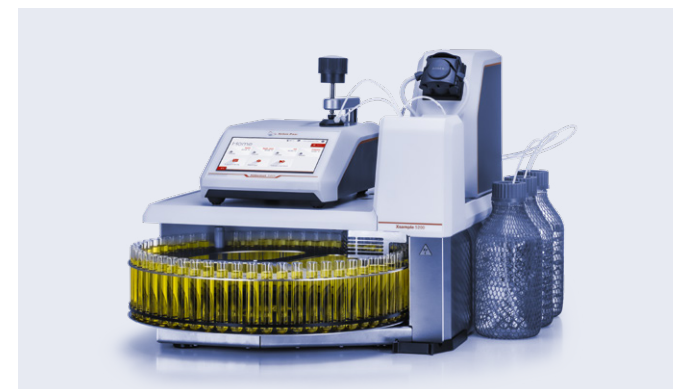
- Accelerates analytical instrument and system qualification via comprehensive AISQ+ documentation



MEASURING SYSTEMS*

For multiple parameters

- Combine refractive index, density, optical rotation, viscosity, and/or pH in one system
- All results in one report



SAMPLE CHANGER*

For automation

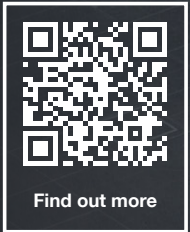
- Run sample filling, measurement, and cleaning of up to 57 samples in one cycle with the Xsample 5100 or 5200 sample changer

*Advanced/Pharma models only

**Pharma models only

Data at Your Fingertips

AP Connect streamlines instrument data workflows in laboratories by providing seamless, efficient data management and integration for instruments. This ensures accuracy, data safety, compliance, and paperless efficiency in a centralized digital hub, which in turn helps improve data quality and reduces overhead costs.



Reliable.
Compliant.
Qualified.

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



		Essential	Advanced	Pharma
		7" hybrid touch, USB printer	7" LCD touch, networked connectivity, user management	Audit trail, 21 CFR part 11, electronic signature, access control
Measuring performance ↓	Range	1.33 nD to 1.55 nD	Abbemat 3001	Abbemat 5001
	Accuracy ¹⁾	±0.0001 nD		
	Temperature range	20 °C to 40 °C		
	Range	1.30 nD to 1.66 nD	Abbemat 3101	×
	Accuracy ¹⁾	±0.00004 nD		
	Temperature range	10 °C to 70 °C		
	Range	1.26 nD to 1.72 nD	Abbemat 3201	Abbemat 7201
	Accuracy ¹⁾	±0.00002 nD		
	Temperature range	4 °C ²⁾ to 105 °C		

1) Valid at standard conditions (T=20 °C, ambient temperature of 20 °C to 25 °C)
2) At max. ambient temperature of 35 °C

General specifications	Abbemat 3001/3101/3201 Abbemat 5001/5101/5201 Abbemat 7001/7201
Light source	LED light source, average lifetime >100,000 hours
Wavelength	589.3 nm (via wavelength-adjusted interference filter)
Min. sample volume	70 µL
Max. pressure in micro flowcell	10 bar
Materials in contact with the sample	
Prism	Synthetic sapphire
Sample well	Stainless steel, optionally Ni-alloy
Seal	FFKM (perfluoroelastomer)
Dimensions / power requirements	
W x H x D	225 mm x 115 mm x 330 mm
Power requirements	100 VAC to 240 VAC +10 %/-15 %, 50/60 Hz, min. 10 W, max. 100 W, depending on sample temperature setting and ambient temperature
Weight	3.5 kg

