

# Attension Sigma

Make wettability & surface tension your competitive advantage.

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# Precision Made Simple with Attension Force Tensiometers

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Attension® tensiometers give you deeper insight and stronger control over every step of your process, enabling more confident decisions, smoother production, and consistently higher product quality. Built specifically for demanding interfacial measurements, they combine an intuitive user interface, modern ergonomic design, and powerful, all-inclusive software to deliver exceptional flexibility and industry-leading automation. Your investment in Attension® tensiometry is backed by the expertise and support of a world-leading surface science company with a proven track record of advancing surface science worldwide.

## From lab curiosity to process control in one platform

Attension force tensiometers are used in research, development and quality control of surfaces and interfaces. They help you characterize your surfaces easily and precisely, saving you valuable time and money.

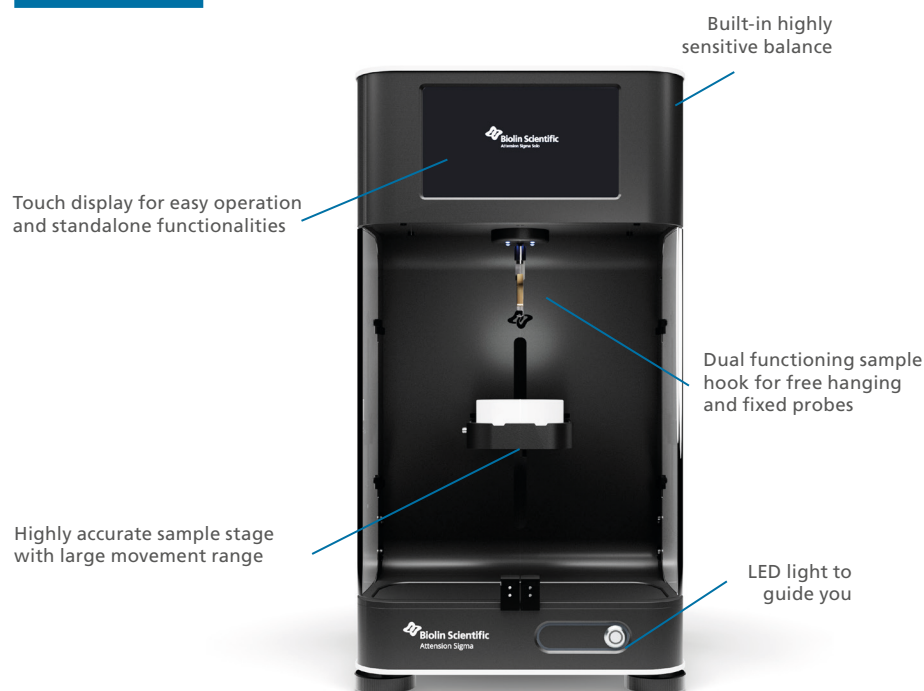
Whether you work with chemicals, energy, oil & gas, electronics, paper & packaging, biomaterials, food or pharmaceuticals, Sigma helps you design better products faster, with confidence.

## Attension in numbers

- In academic and industrial labs since 1992
- More than 3000 installed instruments in 50+ countries
- Mentioned in 10 000+ publications



# Technology & Applications



## How force tensiometers work

Attension provides force tensiometers to fulfill all your research, development and quality control needs. The instruments are based on an extremely sensitive balance to which the measurement probe or sample is attached.

## What can be studied?

### Effectiveness and efficiency of surfactants

Measure surface tension of surfactant solutions at different concentrations to optimize surfactant performance.

### Compare surface treatments on fibers

Thanks to a supersensitive balance, contact angle of thin fibers, down to 7  $\mu\text{m}$ , can be measured.

### Measure adsorption on battery electrodes

Measure electrolyte uptake on electrode as a function of time.

### Study wettability of powders

Contact angle of loose powders can be calculated using the Washburn method.

### Biopharma



### Cleaning



### Energy



### Electronics



### Environmental



### Food & Beverage



# Sigma Peak

Attention Sigma Peak brings together premium automation, advanced measurement capabilities and stand-alone convenience to deliver reliable surface and interfacial tension data, day after day. Whether you are optimizing formulations, qualifying raw materials or running method development, Sigma Peak is your central force tensiometer tool.



## 3 reasons to invest

### From unboxing to results in no time

Sigma Peak is designed to be productive from day one. The instrument arrives pre-assembled with clear guidance so you can go from unboxing to the first measurement in just a few simple steps. Pre-defined measurement scripts and automatic probe alignment and operation minimize decision making, so you can focus on your samples.

### One instrument for research and routine measurements

Run advanced R&D studies and routine quality checks on the same platform. With the software, you can perform complex force tensiometry methods, while the standalone mode of the instrument offers fast surface and interfacial tension measurements for everyday QC, all with consistent hardware and data handling.

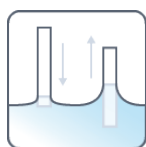
### No hidden costs

With durable hardware, minimal consumable requirements, free software updates, and the ability to serve several teams and applications, Sigma Peak delivers high measurement capacity with a low cost of ownership.

## What you can measure:



Surface tension / interfacial tension with Du Noüy ring, Wilhelmy plate or rod



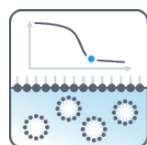
Dynamic Contact angle for advancing and receding angles



Adhesion force for adhesion studies



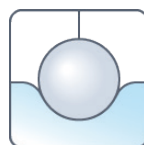
Powder wettability by the Washburn method



CMC for critical micelle concentration measurement



Sedimentation for sedimentation kinetics



Density for liquid density measurements

# Sigma Solo

Sigma Solo is an accurate standalone force tensiometer with automation for routine testing and quality control. Measure surface and interfacial tension or liquid density within minutes via the integrated touch display.



## 3 reasons to invest

### Standalone operation with full automation

The instrument is fully automated, and measurements can be performed easily with a single tap. The embedded software guides you through the measurements of surface and interfacial tension and liquid density. Results are presented on the screen immediately after the measurement is completed.

### Easy result transfer

Sigma Solo utilizes modern USB-C technology which enables easy data output when measurement results need to be saved. Connect the instrument to a PC or a mobile phone to transfer the automatically produced PDF reports to your own data storage system. Up to 100 measurements can be stored in instrument memory.

### Advanced options

Sigma Solo can be equipped with protective doors to reduce the effect of air flow on the measurement results. An advanced sample stage enables a stirrer and the connection of temperature and pH probes for sample monitoring. An ionizer can be added to eliminate issues caused by static charge.

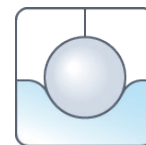
## What you can measure:



Interfacial tension with Du Noüy ring, Wilhelmy plate or rod



Surface tension with Du Noüy ring, Wilhelmy plate or rod



Density for liquid density measurements

# Sigma Base

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Sigma Base is a manual standalone force tensiometer for simple research and quality control. Its robust design and easy operation makes it ideal for educational use. With Sigma Base, you can measure surface and interfacial tension using Du Noüy ring, surface tension using the Wilhelmy plate, and liquid density.



## 3 reasons to invest

### Ease of use

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Sigma Base is a precise, easy-to-use tensiometer for measuring surface and interfacial tension and liquid density. Its intuitive interface makes operation straightforward and results quick and repeatable, making it an excellent choice for both teaching environments and routine lab work.

### Digital balance

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Although the operation is manual, result accuracy is not compromised. A digital balance offers the possibility to make measurements with both Wilhelmy plate and Du Nouy ring. For the Du Noüy ring; Huh-Mason, Zuidema-Waters and uncorrected results can be obtained.

### No PC needed

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Sigma Base is a standalone instrument without the need for external PC. However, if needed, a simple data receiver software allows for easy transfer of the measurement results. In addition, the instrument can be connected with a report printer for simple data output.

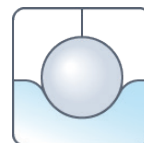
## What you can measure:



**Interfacial tension**  
with Du Noüy ring,  
Wilhelmy plate or rod



**Surface tension** with  
Du Noüy ring, Wilhelmy  
plate or rod



**Density**  
for liquid density  
measurements

# Attension Sigma Variants

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Attension Sigma is a product family of force tensiometers providing automated instruments for advance research and quality control as well as a manual system to be used for occasional measurements and educational purposes. In addition to Sigma Peak, Solo and Base, Attension offers force tensiometers for more specific analysis needs.

## Sigma CMC

**Fully automated critical micelle concentration (CMC) determination with high accuracy**

- **Sigma Peak extended with dispensers**

In addition to Sigma Peak frame, the configuration includes an advanced sample stage to allow stirring, a Wilhelmy plate, and two Titronic dispensers for automated concentration gradient.

- **Automated measurement**

Thanks to external dispensers, Sigma Peak allows for automated dilution of the surfactant solution, making determination of the CMC point easy without the need for user intervention.



## Sigma Transformer Oil

**Evaluate transformer oil quality against a chosen standard with Attension Sigma Transformer Oil**

- **Sigma Solo elegance with additional capabilities**

Sigma transformer oil analyzer is based on Sigma Solo frame proving state of the art usability, data handling and advanced options.

- **Transformer oil analysis according to ASTM D971 and IEC 62961 standards**

Measurements according to ASTM D971 and IEC 62961 standards in addition to measurement modes available for regular surface and interfacial tension and density measurement.



## Configure your Sigma for today's demands and tomorrow's challenges

Attention Sigmas can be complemented with a range of accessories to accommodate a number of applications.

- **Probes and related tools**

Selection of probes such as platinum Du Noüy rings, Wilhelmy plates (both platinum and paper), platinum rods for low volume samples, powder wettability containers, adhesion probes, density and sedimentation probes, calibration and ring reform tools make sure you can utilize your instrument to the maximum.

- **Advanced sample stage**

Adding the advanced sample stage enables the use of stirrer, as well as addition of optional temperature and pH sensors. Available for Sigma Peak and Solo.

- **Ionizer**

Optional add-on to remove static discharge. Especially useful in sensitive measurements such as fiber wettability. Available for Sigma Peak and Sigma Solo.

- **Temperature control**

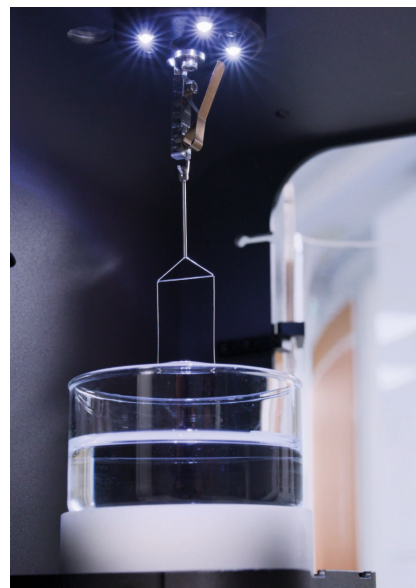
Liquid temperature control from -20 °C to +200 °C to simulate real process conditions. Gas phase temperature control to stabilize air temperature around the sample. Requires an external liquid bath. Available for all Sigmas.

- **CMC dispensers**

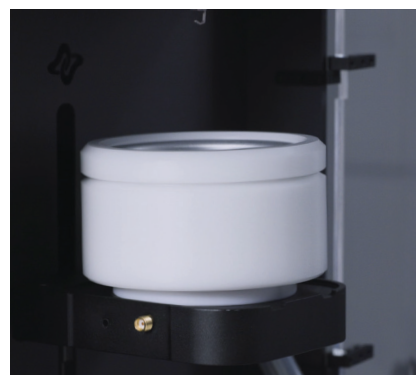
Fully automated titration for CMC measurements with Sigma Peak.

- **Active vibration isolation and cabinets**

To eliminate disturbance such as vibrations and air flow to maximize precision of the measurements.



Du Noüy ring & advance sample stage



Temperature control vessel



### Explore the Sigma Range with Instrument Selector

Use our online instrument selector tool to quickly identify the most suitable solution for your application. By answering a few simple questions, you'll receive tailored recommendations based on your specific requirements. Scan the QR code to access the tool and explore options designed to match your exact needs.

# OneAttension Software

Sigma Peak is enhanced by the seamlessly integrated OneAttension software, offering sophisticated features to support your experimental needs.



- **Best-in-class user interface**

OneAttension offers an exceptionally intuitive user interface. The software is easy to learn, and the logical interface allows even complex measurements to be performed with ease.

- **All-inclusive software**

The all-inclusive software provides unlimited licenses, ensuring that all users have access to its full range of capabilities without additional costs.

- **Free updates and upgrades**

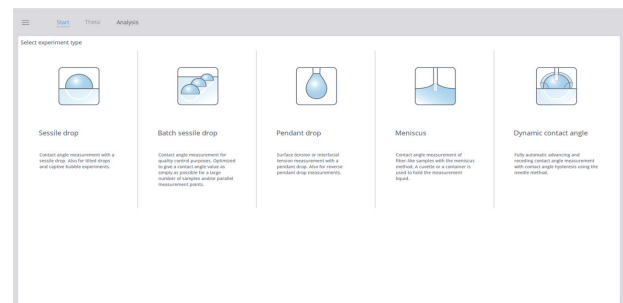
Software updates and upgrades are automatic and free, ensuring your instrument always runs on the latest version.

- **Live analysis**

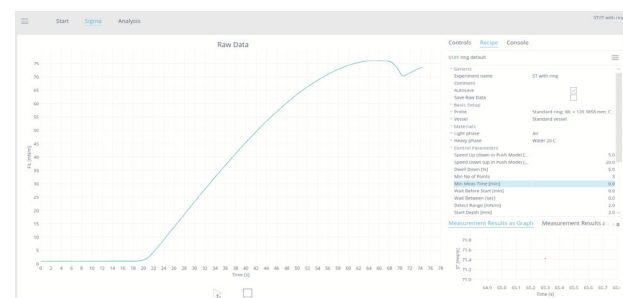
Results are shown in real time during the measurement, allowing you to conveniently monitor progress without switching between the measurement and analysis tabs.

- **Data handling and exporting made easy**

Data analysis, plotting, and statistical analysis can all be done with a few clicks to give you accurate results within seconds. All data can easily be exported to external software such as Excel, or saved in the OneAttension format for use on a personal computer.



Intuitive interface with all measurement modes available



Live measurement window during surface tension measurement with Du Nouy ring

# Stand-alone Functionalities

Sigma Solo is a standalone instrument operated via a touchscreen display. Its embedded software is designed for smooth, trouble free use. Sigma Peak can also be operated in standalone mode, using the same Sigma Solo functionalities.



- **Standalone simplicity with full automation**

Standalone functionality allows you to run surface and interfacial tension measurements with a Du Noüy ring, as well as surface tension measurements with a Wilhelmy plate or rod and liquid density measurements – all without compromising on automation.

- **Guided measurement interface**

Step-by-step on-screen guidance walks users through every stage of the process, so measurements can be started in minutes with only minimal training.

- **Immediate results with easy data output**

Results appear on screen the moment each measurement is complete. When you're ready, connect the instrument to your phone or computer via USB-C to export your data; every measurement is automatically saved as a PDF for secure, traceable record keeping.



Simple parameter setting on the touchscreen display



Live measurement view during surface tension measurement with a Du Noüy ring

Available Measurements					
	Sigma Peak	Sigma Solo	Sigma Base	Sigma CMC	Sigma Transformer Oil
Surface tension	√	√	√	√	√
Interfacial tension	√	√	√	√	√
Critical micelle concentration	automatic*	manual	manual	automatic	manual
Dynamic contact angle	√	-	-	√	-
Surface free energy	√	-	-	√	-
Powder wettability	√	-	-	√	-
Density	√	√	√	√	√
Sedimentation	√	-	-	√	-
Adhesion force	√	-	-	√	-

Balance Specifications					
Measuring range (mN/m)	1...2000	1...2000	1...1000	1...2000	1...2000
Displayed resolution (mN/m)	0.001	0.01	0.01	0.001	0.01
Density range (g/cm <sup>3</sup> )	0...2.2	0...2.2	0...2.2	0...2.2	0...2.2
Density resolution (g/cm <sup>3</sup> )	0.001	0.001	0.001	0.001	0.001
Maximum load (g)	250 / 210*	5	5	250 / 210*	5
Weighing resolution (µg)	100 / 1*	10	10	100 / 1*	10
Force resolution (µN)	1 / 0.01*	0.1	0.1	1 / 0.01*	0.1
Contact angle range	0...180°	-	-	0...180°	-
Contact angle resolution	0.01°	-	-	0.01°	-

Measuring Unit Specifications					
Sample stage	motorized	motorized	manual	motorized	motorized
Sample stage speed (mm/min)	0.001...800	0.001...800	-	0.001...800	0.001...800
Sample stage travel distance (mm)	125	125	-	125	125
Stage positioning resolution (nm)	16	16	-	16	16
Dimensions (W x D x H, mm)	265 * 300 * 500	265 * 300 * 500	275 * 155 * 392	265 * 300 * 500	265 * 300 * 500
Weight (kg)	17	15	5	17	17
Power supply (vac)	100 - 240	100- 240	100-240	100-240	100-240
Power consumption (W)	20	20	7	20	20
Frequency (Hz)	50-60	50-60	50...60	50-60	50-60

Common Accessories					
Temperature control range (°C)	-20...+200	-20...+200	-20...+200	-20...+200	-20...+200
Stirrer	optional	optional	-	included	optional

Software					
Software	OneAttension/ Standalone	Standalone	Data receiver	OneAttension/ Standalone	Standalone
Results Output	.bs, .xls, .csv, .pdf	.pdf	receipt, text	.bs, .xls, .csv, .pdf	.pdf

System requirements	
Recommended system requirements	1 GHz processor, 1 GB ram, 40 GB hard disk drive (20 GB free), 1 USB C port Accessories such as water bath and liquid dispensers require USB A ports
Operating system requirements	Windows 10 and 11 (32 or 64 bit)

\* : optional    - : not available/not applicable

All specifications are subject to change without notice.



## Explore Attension Sigma Range

Learn more about the full Sigma range by visiting our product page. There, you'll find detailed specifications, key features, and application insights to help you better understand each solution. Explore the range in depth and see how our products can support your specific requirements.

## About us

At Biolin Scientific we are committed to empower professionals in surface and interface science and engineering to reach outstanding results faster and easier. Our instruments and sensors are tailored for advanced analysis of thin film properties and surface and interface phenomena at the nanoscale. Trusted by top universities and industrial labs worldwide, our premium solutions help solve complex challenges and drive progress in scientific research and product development.

### **Biolin Scientific AB**

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