

# Attension Sigma

Complete Range of Force Tensiometers

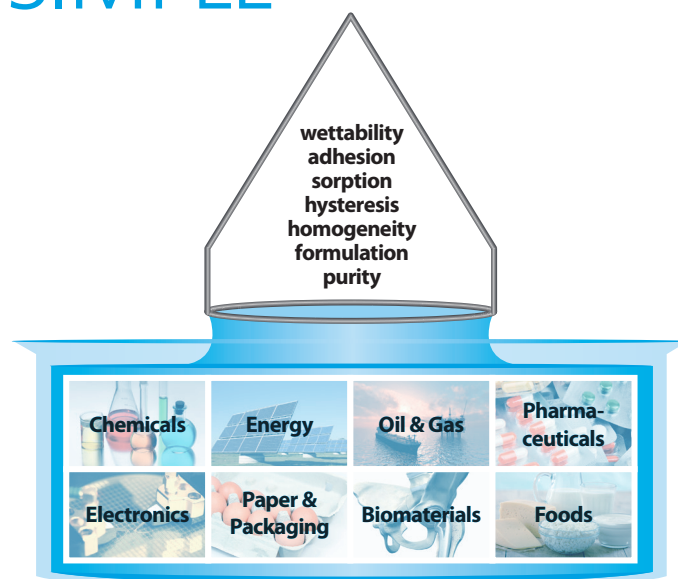
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# PRECISION MADE SIMPLE

Attension® Force Tensiometers are used in research, development and quality control for the study of surfaces and interfaces. They will help you to characterize your surfaces easily and precisely, saving you valuable time and money.

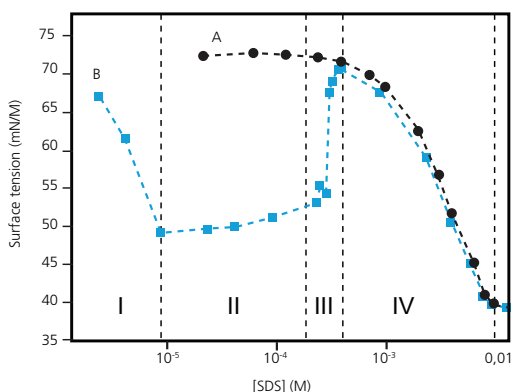
The Attension Force Tensiometer offering enables a wide range of applications from advanced research to quick quality control. Thanks to the versatility, you can get the combination of features that best fit your needs.



**WEIGH THE POSSIBILITIES**

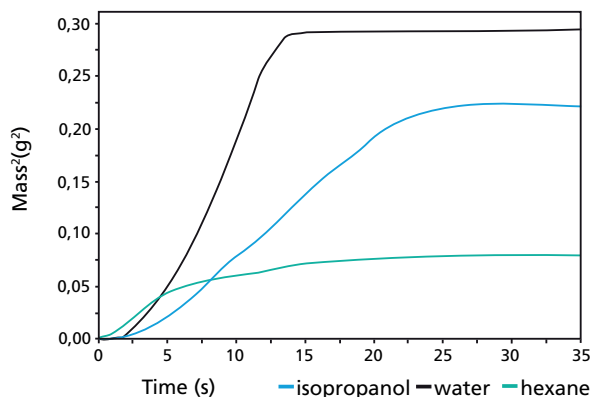
## Application Examples

**Surfactant surface tension**



Surface tension of SDS surfactant solution (A) in water and (B) with porphyrin present. Ref. O.Yaffe, E. Korin and Bettelheim, Langmuir 24 (2008) 11514.

**Powder wettability and absorption**



Wetting of lactose with different solvents. Measurement performed by Biolin Scientific.

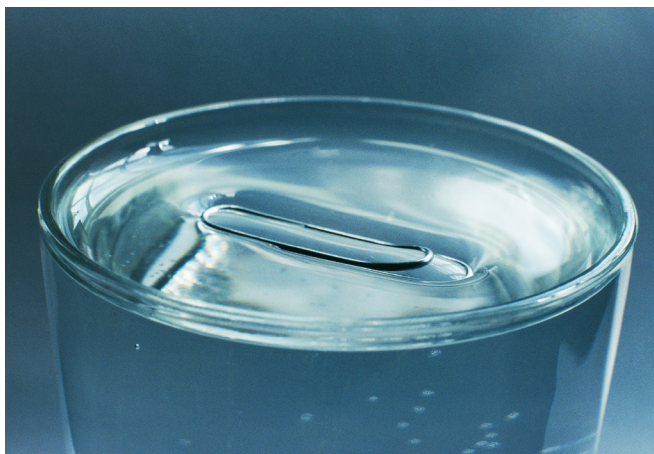
# Attension Force Tensiometers

## Technology

The basic principle of every Sigma measurement is to record and analyze the forces exerted onto a probe or solid sample using a sensitive microbalance. The force seen by the balance can be converted into surface tension or interfacial tension when a platinum Du Noüy ring or Wilhelmy plate is used for drawing up the liquid in a meniscus.

In Critical Micelle Concentration (CMC) measurement, the CMC point is determined by measuring surface tension of a solution at different concentrations. Dynamic contact angles are measured by dipping and withdrawing a solid sample into the liquid sample. By measuring contact angles with different liquids, the surface free energy of the solid can be defined. Powder wettability by the Washburn method is calculated by recording the mass uptake of a powder container brought to the liquid level. Adhesion force can be similarly quantified by measuring the force needed to detach a droplet from a solid surface. Sedimentation and liquid density can also be measured.

Attension offers a full range of force tensiometers from fully automatic models to fully manual model. The precision of each measurement is guaranteed by an ultrasensitive microbalance and accurate sample stage movement.



## Measurements

Attension Force Tensiometers can measure:

- Surface tension
- Interfacial tension
- Critical micelle concentration (CMC)
- Dynamic contact angle
- Surface free energy (SFE)
- Powder wettability (Washburn)
- Adhesion force
- Sedimentation
- Density

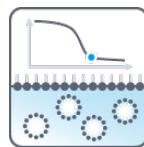
## Measurement methods



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



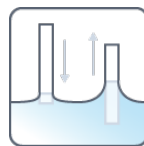
**Adhesion force** for adhesion studies



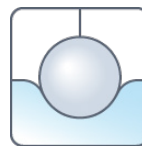
**CMC** for critical micelle concentration measurement



**Sedimentation** for sedimentation kinetics



**Dynamic contact angle** for advancing and receding angles



**Density** for liquid density measurements



**Powder wettability** by the Washburn method

# Sigma 700 / Sigma 701

## - Automation and versatility

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Sigma 700/701 are the ultimate Attension force tensiometers enabling full automation and optimal ease of use even for the most demanding industrial and research applications.

### Complete range of measurements

- Surface tension
- Interfacial tension
- Critical micelle concentration (CMC)
- Dynamic contact angle
- Surface free energy (SFE)
- Powder wettability (Washburn)
- Adhesion force
- Sedimentation
- Density

### Full automation

The system can be fully automated, and measurements can be performed easily with a single click.

### Versatility and precision

Sigma 700/701 have full support of all measurement modes. Sigma 700 is optimized for dynamic contact angle with heavy samples and powder wettability, and Sigma 701 is optimized for single fiber dynamic contact angle measurements.

### Best-in-class software

OneAttension is an all-inclusive software providing all measurement modes, full automation, easy measurement setup, live results, and the friendliest user interface available.



SIGMA 700 / 701