LAUDA Bubble Pressure Tensiometer MPT C

The handy LAUDA Bubble Pressure Tensiometer MPT C also records fast surfactants in millisecond range.

The bubble pressure tensiometer MPT C has been added to the family of LAUDA tensiometers. As opposed to scientific research tensiometers as the MPT C – the final step has been taken for the full automation of dynamic surface tension measuring. Ultimate user-friendliness is achieved without having to take a detour via the PC. The extremely compact stand-alone device offers all the necessary features for the simple measurement of dynamic surface tensions in the laboratory or as a mobile device.

Exact measurements of the dynamic surface tension independent of a PC

The measurements are precise and reproducible, yet time-consuming settings can be presented, stored and transferred to a PC at the touch of a button. The measuring method according to Fainerman also guarantees exact surface tensions at even extremely small surface ages and the accompanying "real" bubble age.

The program offers two measuring procedures. In the first mode, the bubble frequency is reduced in stages, whereby a specified flow range is gradually passed through in order to clearly determine and represent the dependency of the dynamic surface tension from the surface age. The flow is re-adjusted at every single measuring point and is identified as measured value. The evaluation of the measurements and the necessary correction, such as for calculating the dead time, is carried out on a scientifically-founded base.

In the "constant flow" mode, the bubble frequency and, thus, the surface age, is kept constant in order to document any changes in the surfactant concentration, e.g. in the course of reactions.

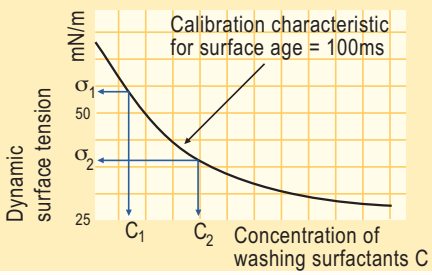
Various areas of application

Thanks to the self-explanatory user guidance, the simple cleaning of the capillaries as well as the compact structure of the unit, the unit is especially suitable for the quality control of dynamically-critical surfactant solutions or for the fast determination of a surfactant at concentrations above the critical micelle concentration. The MPT C is robust, user-friendly and highly precise. Measurements are carried out completely independently by the user and documented along with the necessary settings. Thus complying with the strict specifications of the GLP guidelines.

Example: optimisation of the surfactant dosage

It is only by measuring the surface tension of extremely short-lived surfaces of washing-up liquids that the surfactant content can also be determined above the critical micelle concentration and be optimised directly in the process or a dosage formula be developed from it.

Solution:
The MPT C allows fast and easy measurements of surface tension even at high concentrations of surfactants. Precise determination of concentration is possible due to an extremely large dynamic range from 1 millisecond up to several seconds.

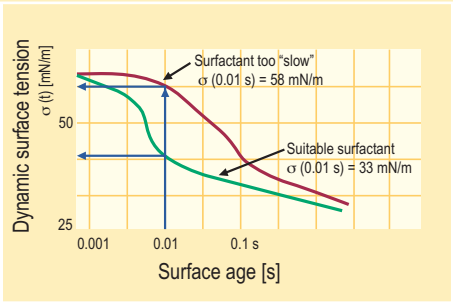


Example: Optimization of drop size

The drop size in sprays, e.g. for agrochemicals, cosmetics or inkjet printers, is dependent on the surface tension immediately after leaving the nozzle. The surfactants that produce the right drop size must "rapidly" reduce surface tension. Normal tensiometers are too slow to measure these rapid changes.

Solution:

The dynamic surface tension is measured by the MPT C on surfaces that are only a few hundredths of a second old. This corresponds to the age of the droplet immediately after leaving the nozzle. This allows suitable surfactants to be selected and their concentration is optimized.

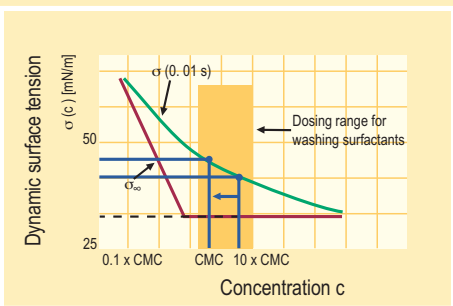


Example: Determination of surfactant consumption

The surfactants consumed during the washing processes are measured online via the changes in surface tension. Normal tensiometers were found to be unsuitable for this process as the surfactant concentration always lies significantly above the critical micellar concentration (CMC).

Solution:

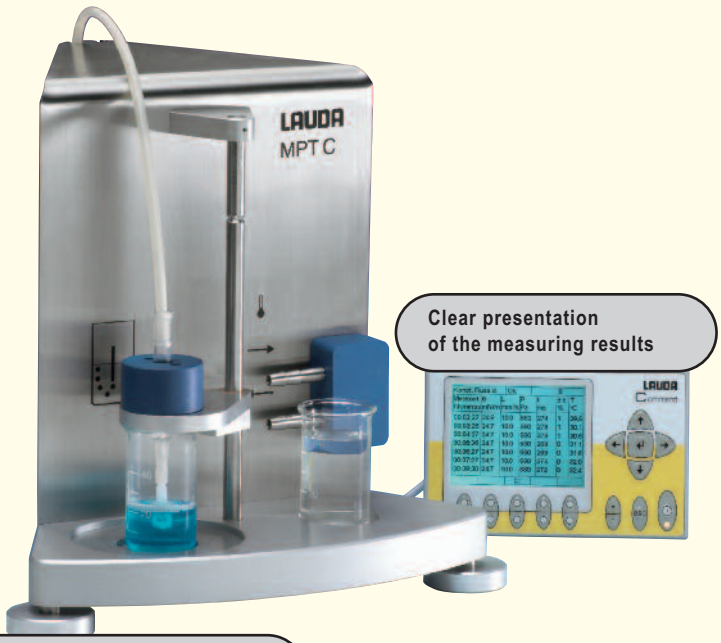
The dynamic surface tension shows a clear dependency on concentration at surface ages of 0.01 s, even above the CMC. This means that the MPT C can determine the effective surfactant concentration and hence surfactant consumption.



The ergonomic measurement desk contains the sensitive pressure sensors and the holder for the capillaries included as standard accessories, humidifier and sample beakers. A temperature probe, combined with a LAUDA thermostat guarantees the stability of the temperature. The measuring capillary can be inserted directly into the reaction vessel via a hose connection up to one metre in length or via a flow cell (bypass) for the "online" monitoring of the surfactant reactions.

Simplest handling via external remote control

The external, handy remote control Command with a graphic display can be intuitively used without the need for any special know-how. The integrated microcontroller offers a series of useful testing methods with which, for example, it can automatically carry out a scan of the dynamic surface tensions over a range of 1 to 2000 milliseconds, thus recording the adsorption kinetics of even very fast surfactants in a complete, comprehensive manner.



Clear presentation of the measuring results

High-resolution pressure sensors guarantee the precise pressure logging

Measuring with double-walled thermostating vessel

The scope of delivery:

- Extremely large dynamic range from 1 ms up to several seconds
- Automatic recognition of the transition point bubble/jet range
- Tabular representation of the dynamic surface tensions, number of measured points, real bubble age
- Graphic representation of the dependency of the dynamic surface tensions on the bubble age, linearly or logarithmically
- User-defined measuring point distance and duration of the measurement
- Storage of up to 50 measure results including the accompanying parameters

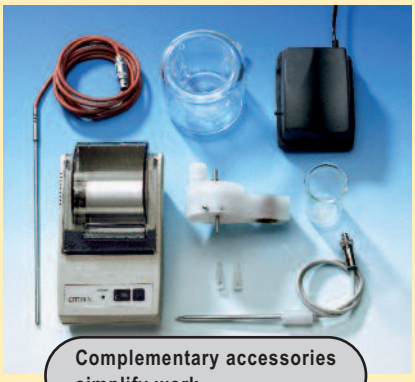
Other options:

- Numerical description of samples determined by the user
- Output of the measured values on an optional printer or PC via RS 232-interface
- Plug-in boards with relay output in order to control the processes via the surface tension

Advantages and technical data MPT C

Output of the measured values is optional via a printer or a data transmission software on the PC via the RS 232-interface. The measurement and the documentation of the temperature in the sample can also be carried out by means of an optional digital temperature probe.

Steel and glass capillaries for various samples



Complementary accessories simplify work

Technical data MPT C		
Measured value		Dynamic surface tension
Measuring methods		Constant flow, automatically changed volume flow, constant surface age
– Resolution	mN/m	0.1
Measuring range of surface tension	mN/m	10 to 100
Dynamic range	s	0,001 - 2
Monitoring mode “constant flow“	min.	1 to 60 and more
Temperature range (sample)	°C	5 - 85
Temperature measurement		Digital (optional)
– Resolution	°C	0.1
– Precision	°C	0.5
Display	mm	320 x 240 graphic display, 11 x 40 characters
Display modes		Tabular, graphic: surface tension as a function of the surface age (t, Lg t)
Selection of measuring mode		Menu-controlled
Parameter input		Menu-controlled
Sample description		Numerical
Measuring point distance mode “constant flow“	min.	Selectable
Data storage		Max. 50 results with date and time
Duration of experiment	min.	3 to 20 (depending on the measuring point density)
Interfaces		RS 232
Documentation		Protocol printer, PC (optional)
Data transmission software		For PC running WINDOWS 98 and higher (optional)
Weight	kg	Approx. 6.5
Dimensions (WxDxH)	mm	280 x 300 x 300
Power supply	V	External power adapter, 100 - 240 V; 50/60 Hz

Standard accessories

- Two glass capillaries
- Set of beakers to take samples

Further accessories

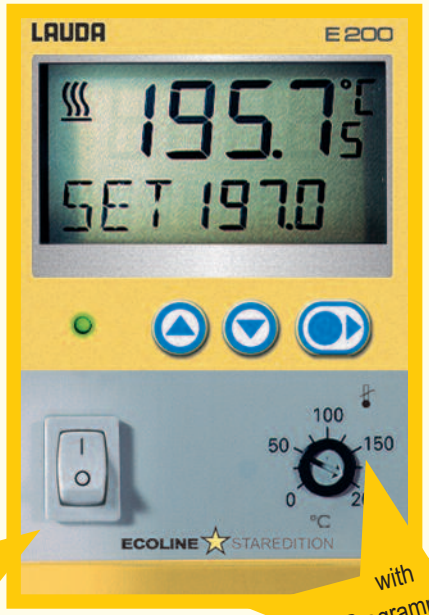
- Digital temperature probe for measuring in the sample
- Data transmission software for PC under WINDOWS (optional)
- Double-walled thermostating vessel
- Diverse types of capillary
- Protocol printer
- Membrane pump for capillary rinsing
- Online flow cell
- Rinsing set

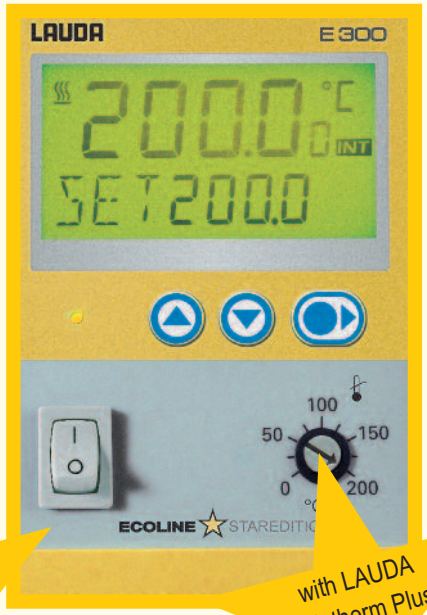
Measuring standards

- ASTM D 3825

Heating and cooling thermostats
for cost-effective thermostating in laboratories from -20 to 200 °C

Recommended LAUDA thermostats for tensiometers





up to 150 °C

with Programmer

with LAUDA Wintherm Plus PC software

E 100

- LCD display, resolution of indication 0.1 °C
- Symbols to show operating status
- Simple 3-key operation
- User-friendly menu guidance
- Display of actual or set temperature
- Overtemperature protection
- Low-level protection
- Vario pump technology
- Audible alarm
- Fault report with automatic self-tests
- Facility for calibration
- Enlarged temperature range up to 150 °C

E 200 (as E 100, but additionally)

- 2-line LCD display, resolution of indication 0.05 °C
- Parallel display actual/set temperature
- Setting resolution selectable °C or 0.01 °C
- Messages of operating states in clear text
- Remote fault indication through floating contact
- RS 232 and RS 485 interfaces
- 2-point factory calibration as standard
- Basic-Programmer for 20 temperature/ time segments, with loop, alteration and pause function

E 300 (as E 100/E 200, but additionally)

- Back-lit 2-line LCD display, resolution of indication 0.05/0.01 °C
- External control
- Screw-on nipples with M 16x1 thread
- Mains voltage outputs for solenoid valve for controlled cooling with mains water or to operate through-flow cooler
- Analogue inputs and outputs 0...10 V or 0/4...20 mA with standard signals e.g. for peripheral equipment
- Remote control as accessory
- Programmer for max. 150 temperature/time segments, devided into 5 programs with loop, alteration and pause function
- LAUDA Wintherm Plus PC software controlled with any PC by interfaces

The right thermostat	E 103	E 203	E 306	RE 104	RE 204	RE 306
Ring/plate tensiometer TD 1 C	●	●	–	–	–	–
Ring/plate tensiometer TD 2	●	●	–	●	●	–
Ring/plate tensiometer TE 3	–	–	●	–	–	●
Drop volume tensiometer TVT 2	–	–	●	–	–	●
Bubble pressure tensiometer MPT C	●	●	–	–	–	–
Bubble pressure tensiometer MPT 2	–	–	●	–	–	●

● = recommended thermostat

Thermostats

LAUDA Ecoline Staredition cooling baths of various sizes made of high-quality stainless steel are made to measure for all of your wishes and provide optimum cooling and heating curves thanks to their insulation. All of the Ecoline Staredition cooling thermostats are equipped with power-saving automatic cooling control. All the units have carrying handles and a drain tap. The panel with the ventilation slots at the front can easily be removed for cleaning.

LAUDA Ecoline Staredition thermostats offer you the top digital technology that is indispensable in the laboratory of today. In order to get only as much technology as you actually require, we have provided the Ecoline Staredition with three different control heads with different performance packages. You only pay for what you actually need.

Cooling thermostat RE 306

Heating thermostats



Technical features		E 103	E 203	E 306
Working temperature range	°C	20...150	20...150	20...200
Temperature stability	± °C	0.02	0.01	0.01
Heating power	kW	1.5	2.25	2.25
Discharge pressure max.	bar	0.4	0.4	0.4
Pump flow max.	L/min	17	17	17
Bath volume	L	2.5...3.5	2.5...3.5	3.5...5.5
Bath opening*/depth	mm	135x105/150	135x105/150	150x130/160
Cat. No.	230 V; 50/60 Hz	**LCB 0691**	**LCB 0692**	**LCB 0699**

Cooling thermostats



Technical features		RE 104	RE 204	RE 306
Working temperature range**	°C	-10...150	-10...200	-20...200
Temperature stability	± °C	0.02	0.01	0.01
Heating power	kW	1.5	2.25	2.25
Cooling output at 20 °C	kW	0.18	0.18	0.20
Discharge pressure max.	bar	0.4	0.4	0.4
Pump flow max.	L/min	17	17	17
Bath volume	L	3...4.5	3...4.5	4...6
Bath opening/depth	mm	130x105/160	130x105/160	150x130/160
Cat. No.	230 V; 50/60 Hz	**LCK 0861**	**LCK 0862**	**LCK 0866**

* Dimensions of bath opening are overall dimensions of the bath which are slightly reduced downwards.
** Working temperature range is equal to ACC-range.