

SITA **CLEAN LINE ST**

Measuring the Surface Tension Inline



- ✓ Highest product quality through controlled process management
- ✓ Quality assurance and documentation of the process development
- ✓ Automatic application-specific dosing of active agents
- ✓ Process solution for high process reliability
- ✓ Cost effectiveness through process optimization

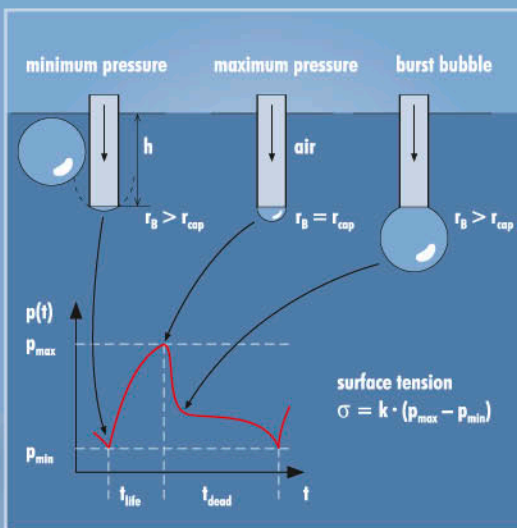
SITA **CLEAN LINE ST**

Process Monitoring of Surface Tension

The Process Tensiometer SITA clean line ST continually and automatically measures the surface tension of process liquids used in the parts cleaning industry, surface technology, semiconductor and photovoltaic industry as well as in the chemical industry.

The parameter surface tension, and thus the concentration of surface-active agents like surfactants, wetting agents and solvents, are measured and documented inline. Connected to the plant control, the SITA clean line ST measuring system carries out an automatic dosing of active agents according to the consumption.

Measurement Principle



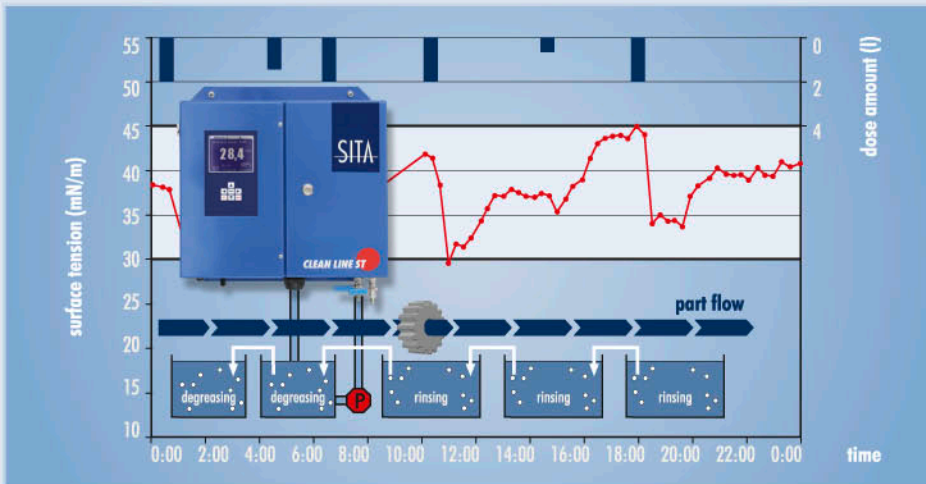
Like all SITA Tensiometers, the SITA clean line ST process measuring device is based on the bubble pressure method to measure the dynamic surface tension in liquids. For this purpose, an air stream is lead into the sample liquid through a capillary which is especially developed for process use.

The bubble that is formed at the end of the capillary continually expands its surface area. When the bubble radius reaches its minimum, the bubble pressure rises until reaching its maximum value. The surface tension is then calculated by determining the difference between the pressure maximum and minimum values.

SITA **CLEAN LINE ST** – Reliable Process Tensiometer

- Plant component for continual process monitoring
- Works fully automated, including cleaning and calibration
- Saves chemicals through automatic dosing according to the consumption: extends the environmental protection and reduces cost

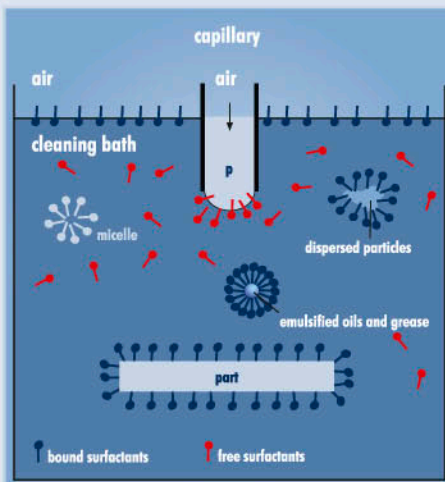
Application



Continual monitoring and dosing according to the consumption:

- Cleaning agent component surfactant in baths of industrial parts cleaning
- IPA-Concentration in texturing baths for silicon-wafers of photovoltaic industry
- Wetting agent concentration of developer solutions for lithography processes of the semiconductor industry

Measurement of Active Surfactants



The concentration of free surfactants influencing the cleaning power determines the value of the parameter surface tension.

Therefore, bubble pressure tensiometers are used in monitoring processes. Air bubbles are produced in the sample liquid with a capillary, upon which the free surfactants attach themselves and reduce the pressure necessary for bubble formation. The correlation of bubble pressure, surface tension and surfactant concentration makes it possible to monitor the consumption of surfactants.

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✓ **Cost effectiveness through process optimization**



Foto: BASF

Cost reduction is made possible through the use of the SITA clean line ST in cleaning plants for the surface treatment of automobile bodies as well as precision pieces for motors and pumps with optimized use of water, cleaner, as well as energy when cleaning quality is stable.

Technical Data

Surface Tension

Measuring Range	10 ... 100 mN/m (dyn/cm)
Resolution	0.1 mN/m (dyn/cm)

Bubble Lifetime

Control Range	15 ... 15,000 ms
Resolution	10 ms

Sample Temperature

Measuring Range	0 ... 80 °C
Resolution	0.1 K

Liquid Tangent Materials

Metal Vessel Type	Stainless steel (V2A & V4A), PTFE, FKM (viton), PEEK, PU, PA
Glass Vessel Type	Stainless steel (1,4401, 1,4408, 1,4571), borosilicate glass, PTFE, FKM (viton), PEEK

Interfaces

Operational Voltage	110 ... 240 V, 50 ... 60 Hz, maximum 350 W
Remote Maintenance	Modem, analogue
Current Interfaces	
Surface Tension	0.1 ... 100 mN/m : 4 ... 20 mA
Temperature	0 ... 100 °C : 4 ... 20 mA
Signal Error / Interruption	Isolated contact, max. 2A
Signal Over-range	Isolated contact, max. 2A
Signal Underflow	Isolated contact, max. 2A
Measurement Request	Access for isolated contact
Water Supply	2 ... 6 bar, G 1/4" inner span (10 ... 80°C)
Sample Supply	1 ... 6 bar, G 1/4" inner span (10 ... 80°C)
Water & Sample Drain	Tube fitting

General Data

Housing	Stainless steel (1,4301)
Dimensions (W x H x D)	480 x 480 x 170 mm
Weight	ca. 23 kg
Acceptable Surrounding Temperature	10 ... 40 °C

Process-specific System Solution



The measuring system SITA clean line ST can be adjusted to each customer's unique inspection tasks.

Used with an industrial PC or an SPS with touch panel, the central control unit of the SITA clean line CC allows process-specific system solutions to be realized. The customized software controls the cleanliness inspection, saves and visualizes the measured data and communicates with superordinate process controls.

Upon the basis of a combined analysis of process and plant, SITA application engineers develop the SITA clean line system solutions to be adapted to each customer's specific set of criteria.

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