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SITA Lab Solutions

SITA FoamTester

Analysing foam parameters
Controlling surfactant effects



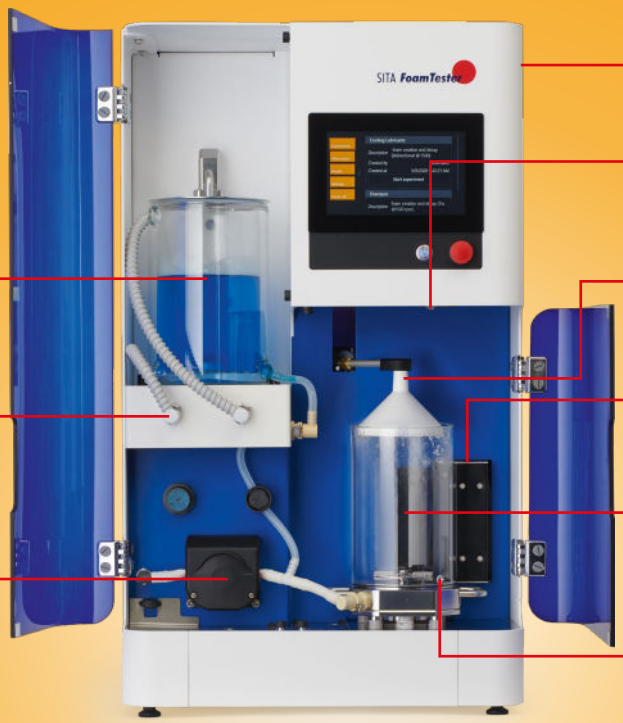
- ✓ Fully-automated foam analysis
- ✓ Precise repro-ducible foaming
- ✓ Innovative optical measuring systems
- ✓ Measuring foam and liquid volume
- ✓ Analysing foam structure
- ✓ Recording drainage
- ✓ Automated cleaning

Create foam – Measure foam – Analyse foam – Understand foaming

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Automated SITA foam testing

Functionial components of the SITA FoamTester



- Ethernet connection to office PC and software SITA-FoamLab
- Foam Surface Scanner
- Rinsing system with external supply for cleaning liquid
- Foam Interface Scanner
- Measuring vessel with stirring unit
- For connection of external dosing unit
- Sample reservoir with magnetic stirrer
- For connection of external thermostat
- Peristaltic pump and sample drain

Sample preconditioning → **Filling** → **Foam testing** → **Cleaning**

Benefits of automated foam testing

- ✓ Autonomous repetition of test runs without intervention by the user
- ✓ Immediate statements about the reproducibility
- ✓ Fast and easy screening of test and sample parameters

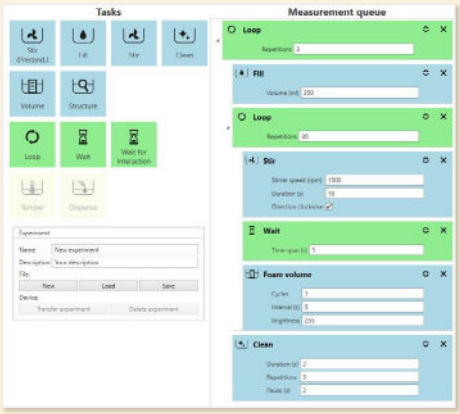
Convenient sample handling

- Automatic sample preconditioning (e.g. temperature, concentration of additives) with external devices
- Integrated sample reservoir with magnetic stirrer for running multiple test series
- Automated self-cleaning system with external liquid supply (e.g. tap water)



Flexible experimenting

- Easy and free creation of experiments at the office PC by drag'n'drop using fully parameterisable device tasks and supportive functions (loops and timers)
- Creating multiple re-usable templates and exactly repeatable test routines to select and start by a single touch at the device
- Instant start with test routines for typical applications pre-defined by SITA





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Create foam

Differentiation of various sample formulations and reproducible test sequences using an application-oriented foam creation with proven SITA method

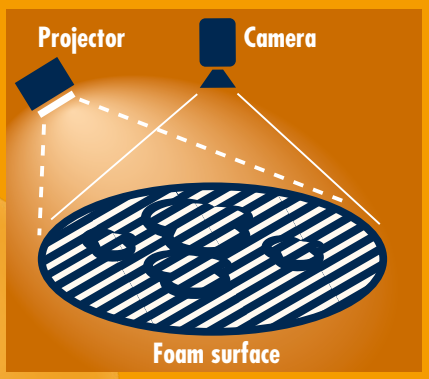


- Established SITA standardised stirring disc
- Minor influence of the vessel glass on foam formation
- Removable measuring vessel with stirring unit
- Variable stirring parameters: speed, duration, acceleration, direction, intervals

Measure foam

Use of optical, contactless measuring methods

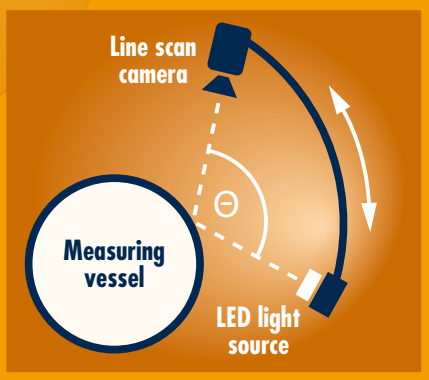
- **Foam Surface Scanner:** Determination of the topography of the foam surface and therefore the total volume using the structured-light method

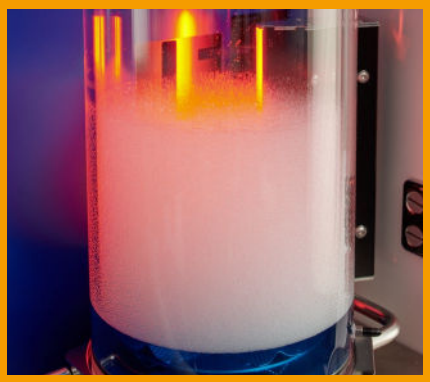


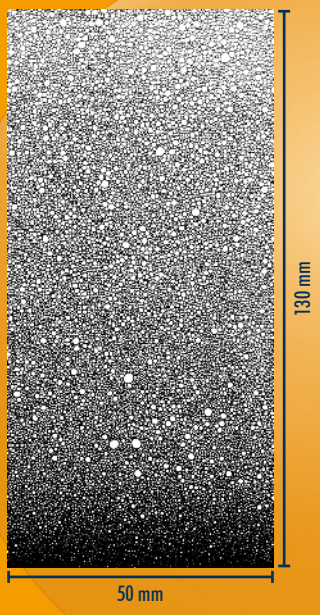




- **Foam Interface Scanner:** Determination of the foam structure and the liquid level by optimal use of a movable camera system, which illuminates and observes the measuring vessel at an angle Θ above the critical angle for total internal reflection



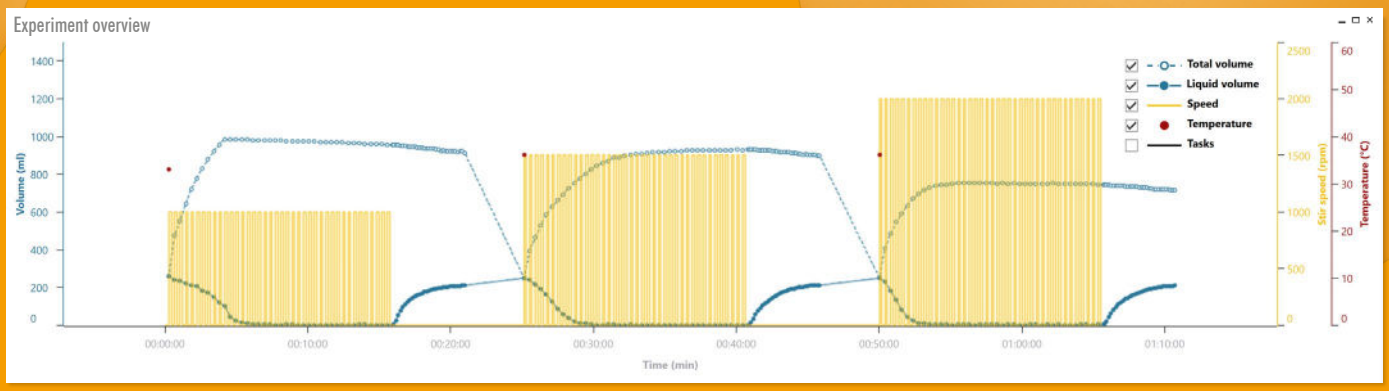




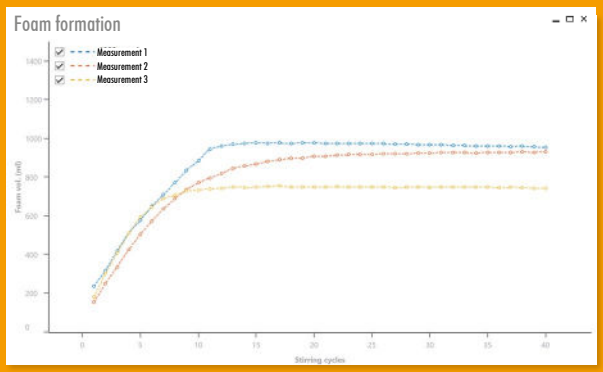
- Automatic acquisition of the total volume (liquid and foam) by the Foam Surface Scanner, of the residual liquid volume by the Foam Interface Scanner and of the foam volume in combination
- Recording of the foam structure over an area of 130 mm x 50 mm
- All measurements in the same measuring vessel, connected to the thermal circuit
- Without limitations regarding light transmission and conductivity of the sample

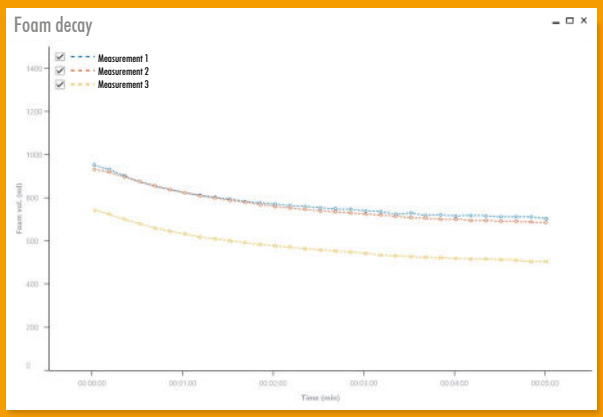
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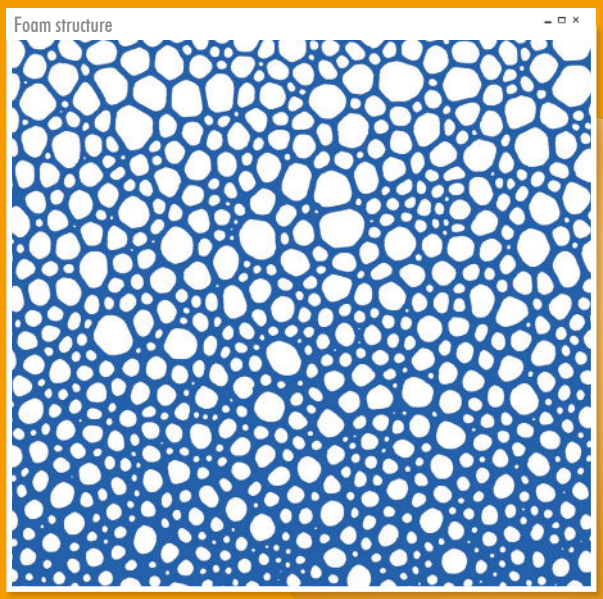
Analyse foam and understand foaming



- **Convenient evaluation of measuring data with the software SITA-FoamLab in the office**
- **Complete transparency of the measuring progress and the results by intuitive visualisation**
- **Analysis of the slope and the resulting volume during foam formation**
- **Analysis of the foam decay and the drainage**
- **Analysis of bubble sizes and shapes in the foam structure**
- **Comprehensive characterisation of foam and foaming**
  - By the determination of further parameters such as half-life period and foam density
  - By the individual height-dependent evaluation of foam structure parameters such as average bubble size or circularity index
  - By tracking time dependent changes in the foam structure
  - Flexible comparison by clear display of different measuring sequences
  - Easy export of data and results for documentation







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Fields of application

Optimisation of surfactant containing products in

- Product development
- Raw material development and selection
- Product processing and application
- Quality and process assurance

Application examples

Cosmetics

- Influence of the formulation and raw materials on foaming behavior
- Foam stability of toothpaste and foam baths
- Foam structure as a reference point for user perception

Cooling lubricants

- Influence of water hardness on aging processes
- Durability of defoamers
- Optimisation of the filtration process to prevent foaming

Inks, paints and coatings

- Effectiveness of defoamers

Cleaning agents

- Influence of temperature on the foaming of spray cleaners
- Influence of contaminations on the foaming in cleaning baths

Liquid processing industry

- Foaming behaviour of flow suspension in paper industry
- Recipe optimisation to reduce foaming in bottle filling of beverages
- Adjustment of foaming production auxiliaries in textile manufacturing
- Foaming effects of polymers in plastic production

Enter the world of REAL foaming

- ✓ **Fully automated processing and flexible screening of liquids**
- ✓ **Established and application-oriented recreation of foams**
- ✓ **Advanced measuring methods and data analysis**
- ✓ **Real insights into foaming**



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Technical data

Foam creation

Recommended sample volume	(200 ... 500) ml
Usable measuring vessel volume	1,500 ml (incl. foam) Dimensions: height 180 mm diameter 110 mm
Capacity of sample reservoir	2,000 ml
Sample tempering of measuring vessel and sample reservoir	(0 ... 60) °C using an optional thermostat
Stirring speed	(0 ... 2,000) rpm (bidirectional)
Adjustable stirring programs	speed, duration, direction, acceleration

Analysis of foam volume (foam formation and decay)

Measurement values	total volume, foam volume, liquid volume
Evaluated parameters	max. foam volume, foam half-life, flash foam
Measuring range total volume	(0 ... 1,500) ml; resolution 1 ml
Measuring range liquid volume	(0 ... 500) ml; resolution 1 ml

Analysis of foam structure

Parameters	number of bubbles, bubble size distribution, mean bubble diameter, roundness
Evaluation area	height 130 mm, width 50 mm
Resolution	3,200 dpi

General data

Rinse connection	3/4" (2 ... 6) bar
Operating temperature	(10 ... 40) °C
Power supply	(100 ... 240) V, (50 ... 60) Hz, 300 W
Dimensions (HxWxD)	(770 x 450 x 305) mm
Weight	approx. 35 kg
PC interface	Ethernet

The SITA Foam Testing System is available in Expert and Basic version

- Expert version: Consists of SITA FoamTester and PC software SITA-FoamLab Expert (foam structure analysis)
- Basic version: Consists of SITA FoamTester and PC software SITA-FoamLab Basic

Accessories: External laboratory devices for sample conditioning

- Extension of experiments by additional functions for sample conditioning
- Automatic integration and direct control within the test sequence



Automatic dispenser
CAT Contiburette μ10D
for the dosage of liquids



Thermostat Lauda ECO E4S
for heating of sample liquids
(room temperature ... 200) °C



Thermostat Lauda ECO RE 415S
for cooling and heating of sample liquids
(-15 ... 200) °C

M05-100013 / Version 3.0

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