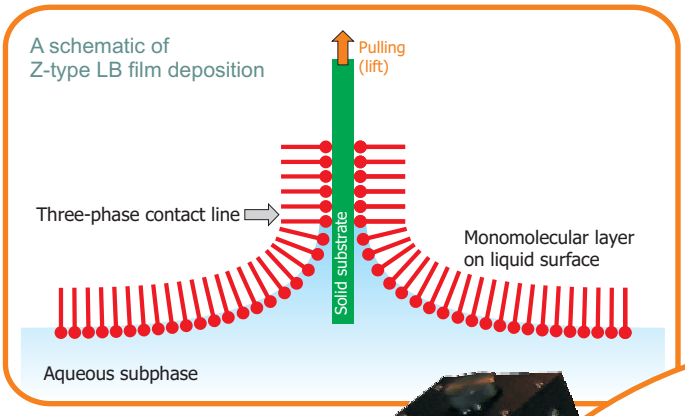
Langmuir–Blodgett Trough LT-103

Langmuir-Blodgett trough LT-103 is intended for deposition of mono- and multimolecular films on solid samples according to the Langmuir–Blodgett (LB) technique and for construction of homogenous single- and multi-component films by the horizontal precipitation (HP) technique.

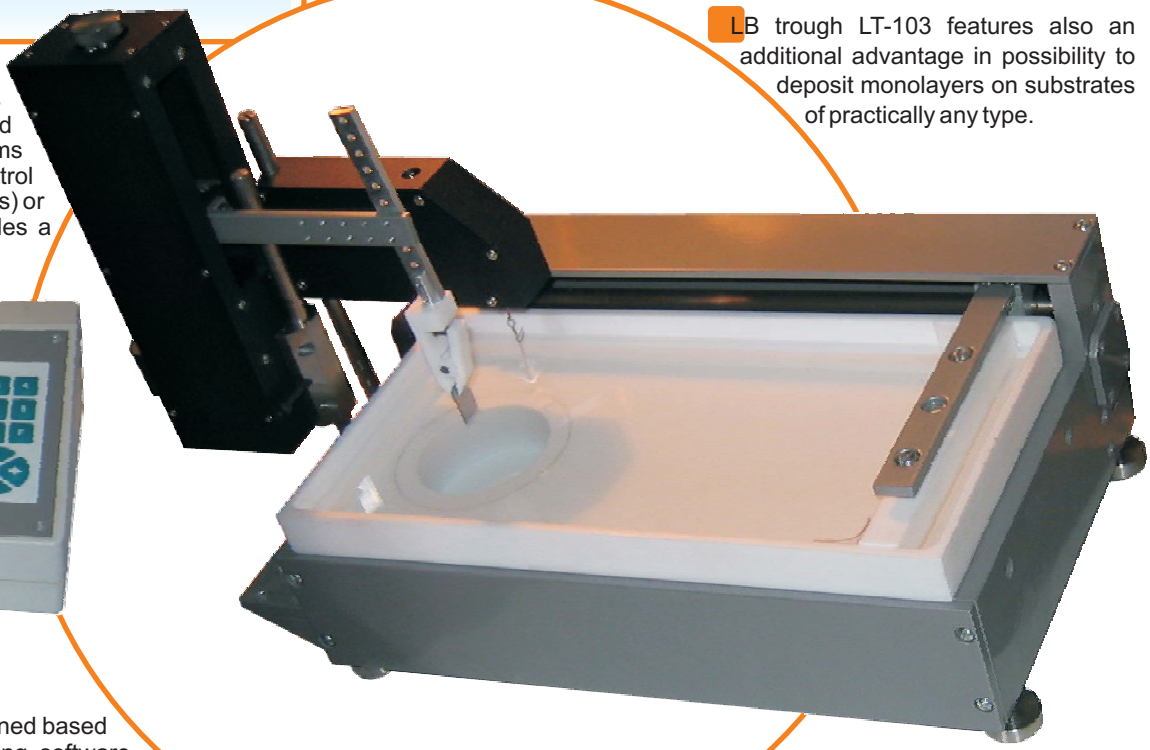


Thin organic films (monomolecular layers) are the source of high expectations in the development of such promising devices as sensors, detectors, displays, electronic circuit components etc. The possibility to synthesize organic molecules, almost without limitations, with desired structure, properties and functionality in combination with advanced thin film deposition technologies enables the production of electrically, optically and biologically active components on a nanometer scale.

An organic thin film can be deposited on a solid substrate by various techniques. Langmuir-Blodgett (LB) technique is one of the most promising techniques for preparing such thin films as it enables the precise control of the monolayer thickness, homogeneous deposition of the monolayer over large areas and the construction of multilayer structures with varying layer composition.

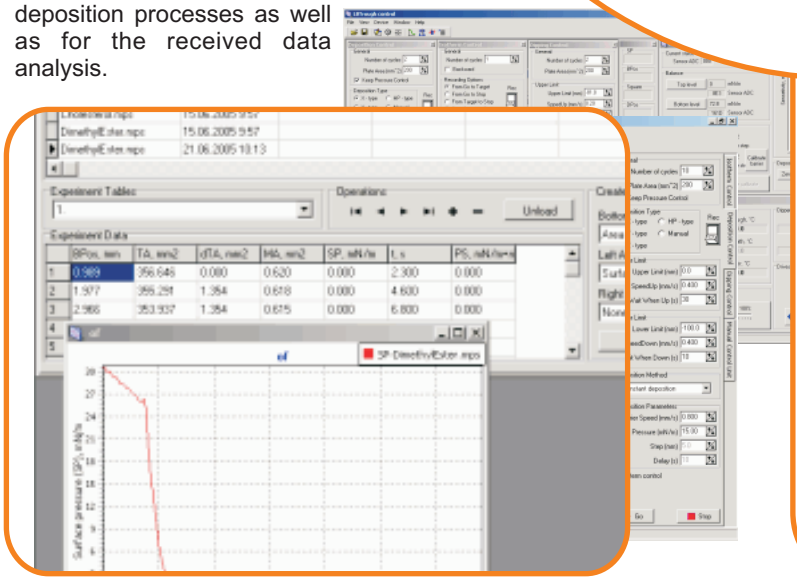
LB trough LT-103 features small volume of a liquid (aqueous subphase), high quality and homogeneity of constructed films over big areas, a possibility to control it from the host PC (including scripts) or from stand-alone unit, and includes a set of useful accessories.

USB connection
with host PC

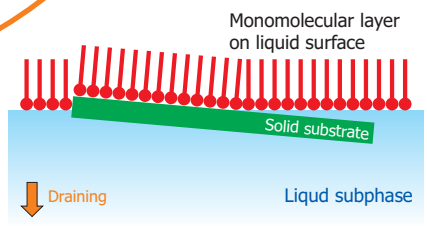


LB trough LT-103 features also an additional advantage in possibility to deposit monolayers on substrates of practically any type.

Trough LT-103 has been designed based on long-term experience. Its driving software provides wide possibilities for control over the deposition processes as well as for the received data analysis.



A schematic of horizontal precipitation (HP) method



Trough LT-103 was designed not for LB films deposition only but also for realizations of an alternative technique of horizontal precipitation (HP, in contrast to traditional vertical LB technique) – application of highly uniform and homogenous films on horizontal surfaces. HP technique enables use of a wide spectrum of surfactants both in 'solid' and 'liquid-stretched' states independently of the surfactant's end group polarity. Deposition process according to HP technique is extremely simple and fast especially at modification of big areas. For example, one need 3to 5 minutes to modify surface of standard silicon wafer of diameter 100 mm.

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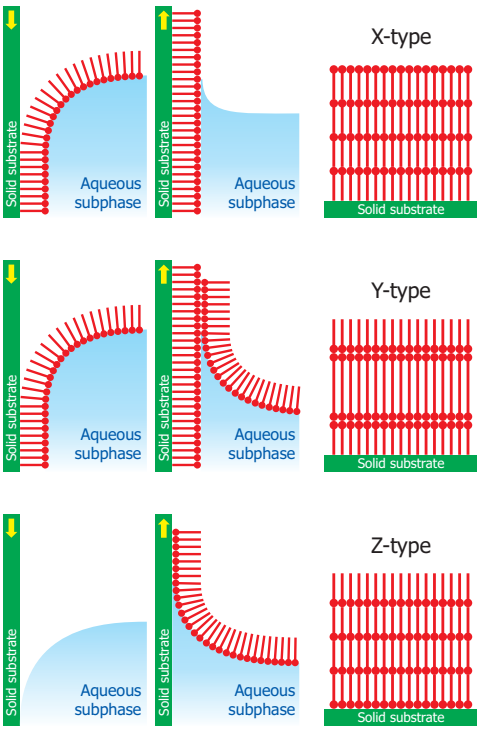
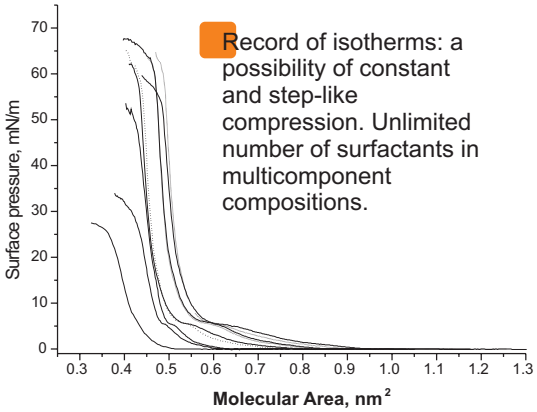
Langmuir–Blodgett Trough LT-103

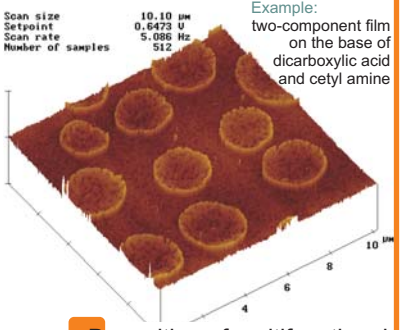
TYPES OF DEPOSITED LB-FILMS



APPLICATIONS



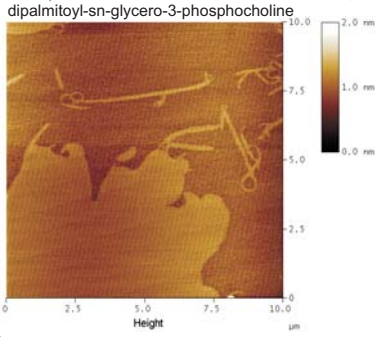
Record of isotherms: a possibility of constant and step-like compression. Unlimited number of surfactants in multicomponent compositions.



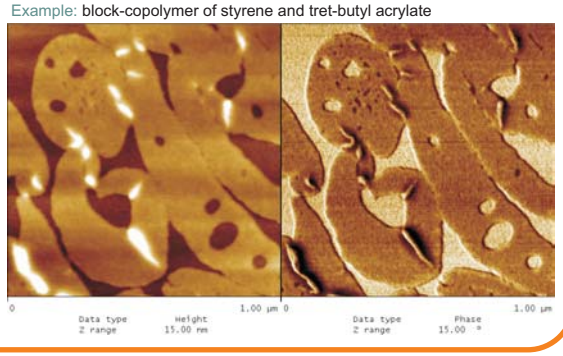
Example: two-component film on the base of dicarboxylic acid and cetyl amine

Deposition of multifunctional monomolecular and multilayer films from aqueous surface. The deposited film exactly keeps its structure at the transfer on solid surface.

Example: Quercetin-3-O-Palmitate in matrix of 1,2-dipalmitoyl-sn-glycero-3-phosphocholine



Example: block-copolymer of styrene and tret-butyl acrylate



SPECIFICATION

Full free surface area:	400 cm^2
Surface area confined with the barrier:	365 cm^2
Compressed (effective) area:	258 cm^2
Liquid medium volume:	1000–1050 cm^3
Dipping well:	75 mm deep, diam. 60 mm
Maximum dimensions of the immersed substrate:	70x55x4 mm (h-w-t)
Number of barriers:	One
Velocity range of the barrier motion:	5.4–210 mm/min (single side comression)
Dipper mechanism stroke:	85 mm (vertical position of the unit can be adjusted manually)
Dipper mechanism velocity range:	0.12–70 mm/min,
Step of the dipper mechanism velocity change:	0.1 mm/min
Possibility of altering different monolayers deposition:	Available
Delay between the consecutive layers deposition:	0–100000 s
Surface tension sensor:	Balance with Wilhelmy plate (vertical position of the sensor can be adjusted)
Sensitivity / Working range of the surface tension sensor:	0.01 mN/m / 0–100 mN/m (stepped and fine adjustment of the range are available)
Overall dimensions:	Trough with mounted rig - 400x200x250 mm (w-d-h); Control unit - 220x165x105 mm (w-d-h); Weight 7 kg (8 kg with optional rig).
Supply voltage / Power consumption:	220 V - 50 Hz / not more than 40 W
Additional accessories:	Substrate clamping holder for fixing the sample on the dipper lever. Rig for film application by the horizontal precipitation method (by liquid medium draining)*. PTFE inserts for reduction of the working fluid volume. PTFE cylinder for restricting free surface area around the immersed substrate.
Additional options:	The trough can be equipped with a jacket for liquid thermostating by an external device. Maximum temperature of the liquid in the trough up to +60°C (higher temperature allowed).

* Note. Full-functioning driving software (for Win32) is included. Connection with host PC (not included) via USB port.

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