

ABOUT SOFTLITHOBOX®

## Create your Molds

## Replicate your Chips

### Soft lithography is now easy

Our specialists selected and adapted the best instruments to make them work together with reliable process. It ensures you to get an easy soft-lithography process while keeping the best performance. It is now easy to fabricate your own PDMS microfluidic chips in any biology or chemistry lab without clean room.



### Publications are the priority

As scientists, we know that publications in high impact journals are a top priority. With the SoftLithoBox® you can accelerate your research involving microfluidic systems and get experimental results faster.

### How it works ? step by step

You contact us, our specialists study your needs, fit the pack, provide and install all the equipment, provide all the accessories and chemicals, develop your process, train your team and give you tutorials for future lab members. One month after your first call you can be ready to execute the whole fabrication process and obtain all your microfluidic chips in 24-48 hours maximum.

WHY ?



BlackHole·Lab

# ▶ SoftLithoBox®

A Turnkey System that Includes Everything

## No more delay to obtain your molds & PDMS devices ... DO IT YOURSELF!

**Save Time** Product selection, interaction with providers, installation, training... We do everything for you!

**Easy to Use** Our reliable protocols will help you to quickly become autonomous.

**Save Space** The equivalent of a conventional clean room in 3 m<sup>2</sup>.

**High resolution** reach the same resolution than the one you can get into clean room.

### 3 STATIONS\*

SU-8 photolithography station

PDMS molding station

Full PDMS station

STATION



### A TURNKEY OFFER

Our soft-lithography station is a turnkey offer: no need to acquire any additional equipment. Basically, only a chemical fume hood and a little working space is required.

Get high-performance equipment for a limited budget. We adjust the offer, together, to be fine-tuned to your needs.

TURNKEY OFFER



*\*Detailed in the pages below*

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## Avoid tedious procedures

There is no need to have an access to a clean room anymore, your fabrication facilities are installed directly in your lab and are accessible at anytime.

## Training & support

You avoid weeks or months of training on highly sophisticated and expensive clean room equipment each time a new collaborator joins your lab. Our soft lithography equipment are specifically selected to be efficient and simple to use. Similarly, our protocols are adapted to be followed intuitively. Even for people unfamiliar with soft lithography, one day training is sufficient to be able to produce chips autonomously.

## Keep control

You keep full control of your intellectual property, avoid disclosing your novel microfluidic designs and limit unnecessary collaborations. Why ask someone else to manufacture your chips when you can easily do it yourself?

## Suitable apparatuses

You get all the necessary equipment and accessories with a limited budget. We work with the best instrument providers in the field: the SoftLithoBox is exclusively composed of high-performance apparatuses for soft lithography. We have, nevertheless, kept affordable prices in mind so that you can invest your grants and funds in other areas of your research.



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# ► SoftLithoBox

## SU-8 photolithography station

### SU-8 STATION

Our benchtop SU-8 photolithography station includes everything you need to fabricate molds for microfluidics in your lab and test new experiments fast.

### A TURNKEY OFFER

**Programmable hot plate**

**Programmable spin coater**

**Programmable UV lamp...**



All chemicals for photolithography (SU-8, SU-8 developer, TCMS, Isopropanol, Acetone, etc.) and all associated accessories (Silicon wafers, tweezers, etc.) are included.

### ► BENEFITS

- Reach the same pattern resolution as in a clean room
- Get strong photoresist patterns for numerous future PDMS moldings
- Work with robust processes which enable easy reproducibility
- Fabricate your molds without initial knowledge in microfabrication
- Get the best equipment to ensure your facility a long lifetime



Each pack can be adapted to your laboratory and technological requirements. We can provide quote for special featured pack however, we do not provide separated quote for individual equipment.

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▶ SERVICES

### Customization

We adjust the offer, together, to be fine-tuned to your needs. Each facility can also be sold individually and/or can be customized according to your specific needs.

### Guidance

More than advices on your equipment we are always pleased to discuss about scientific approach, putting at your disposal our experience.

### Our expert team

We ensure a clean installation of the facilities in your lab. We also train your team and give you our tips : don't waste any more time with numerous trials and errors. Within a week you will be ready to begin the fabrication of your own chips with serenity.

▶ COMPANY

### BlackHole Lab

After several years of research and test, we found a well-thinking set which is working together to give the best answer for microfluidic fabrication. But we are not stopping here ad we always improve or adapt the offer to keep us at the cutting edge of the technology.

We have done the choice to gather numerous PhD inside the compagny to understand your needs and concerns. When dealing with microfluidics, we know the difficulties you may encounter at every step of the microfabrication process. Numerous prestigious labs already trust us for their microfluidic applications, so you can take advantage of our expertise with complete confidence.



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## PDMS molding station

### PDMS MOLDING STATION

With our benchtop PDMS molding station, just take your molds and replicate PDMS devices directly in your lab. Our PDMS molding station includes all equipment for you to start your fabrication immediately.

### A TURNKEY OFFER

Complete air plasma system

Oven for fast PDMS curing

Desiccator for PDMS degassing...

▶ FEATURES

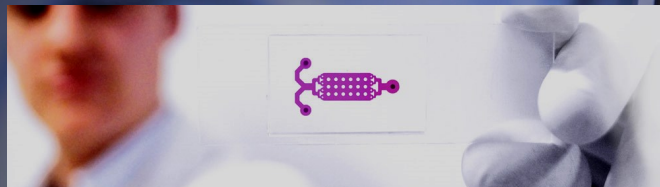


All chemicals (PDMS, TCMS, Isopropanol, Acetone, etc.) and all lab accessories (glass slides, Petri dishes, disposable cups, stirring rods, scalpels, etc.) are included.

To do PDMS membrane a spin coater can be add in option!

▶ BENEFITS

- Get highly reproducible processes for your chip fabrication.
- Get a fast fabrication process and develop your chip in 24h
- Get advantage of our knowledge for your soft-lithography process



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**SERVICES**



**Award-winning**

The SoftLithoBox® is a new and award-winning offer intended for you to rapidly prototype your own microfluidic systems independently.

With The SoftLithoBox®, you can control the entire fabrication process. Our PDMS molding and SU-8 photolithography stations can be customized and/or combined to perfectly fit your needs.

Elveflow® also offers a wide range of associated services, we install the facilities in your lab and train your team. In a few hours, you can start the fabrication of your microfluidic systems with serenity.

**HIGH QUALITY EQUIPMENT**



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▶ **SoftLithoBox**

Full soft lithography station

**FULL SOFTLITHO STATION**

The full softlithography station, includes everything you need to fabricate molds and replicate PDMS devices directly in your lab. Our pack includes all equipment and support to produce chips autonomously.

**A TURNKEY OFFER**

**FEATURES**



Complete air plasma system

Oven for fast PDMS curing

Desiccator for PDMS degassing

Programmable Spin-coater

Programmable UV lamp

Programmable hot plate...



All chemicals (PDMS, TCMS, Isopropanol, Acetone, etc.) and all lab accessories (glass slides, Petri dishes, disposable cups, stirring rods, scalpels, etc.) are included.

**BENEFITS**



With the full soft lithography pack facility, you can quickly create your own molds and replicate your devices out of the clean room.

Our specialists selected the best instruments and made them work together to ensure you an easy soft-lithography process with the best reachable performance. We also develop robust processes to enable anyone to perform high resolution photolithography.

Each pack can be adapted to your laboratory and technological requirements. We can provide quote for special featured pack however, we do not provide separated quote for individual equipment.

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## Major strengths

- Designed specifically for ease-of-use
- Simple to program from the operator panel or your PC
- Ability to allow process inputs from external sources
- Designed specifically for continuous process development
- Operational statistics stored continuously & permanently
- Easy to clean

## A device adapted for Soft-lithography applications

- Its compact size with the little panel control attached make the device really movable.
- The product has been widely use to resin coating.
- The lid on the lid enables to do dynamic coating.

## Safety & protection

- Complete electrical isolation from the operator, fool-proof door interlock, and UL and CSA approval of components assure many years of safe, trouble-free performance.
- Interlocks prevent rotation when the vacuum switch has not been engaged and when the lid is open.
- System are CE and RoHS compliant, and all certificates are sent with each system.

## Warranty

Warranty 1 year.



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## ▶ SoftLithoBox®

### SPIN Coater

▶ FEATURES

## SPIN Coater system

This spin coater is compact and packed with advanced features. The spin processor system will accommodate up to  $\varnothing 150\text{mm}$  wafers and  $5" \times 5"$  ( $127\text{mm} \times 127\text{mm}$ ) substrates. It is perfectly fine-tuned to do controllable and repeatable resin layer.



▶ SPECIFICATIONS

Weight	12.7 kg (28 lbs)
Power	300 W
Power supply	95-240V ; 47/63 Hz
Dimension (HxWxD)	303x380x380 (in mm)
Need vacuum	20-28 inches Hg
Need nitrogen or CDA	60-70 PSI (4-5 bar)
Round per minute range (RPM)	From 1 to 12 000 RPM
Wafer size	Up to 6 inches

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## Major strengths

- Temperature ramp to heat up and cool down.
- A good temperature uniformity.
- A slowly natural cool down.
- Microprocessor display maintains consistent temperature.
- RS232 port outputs time count, temperature and set point directly to your PC.

## A device adapted for Soft-lithography applications

- Its aluminum top plate and its great heating surface area enables to have a wide enough zone where the temperature is homogeneous for efficiently bake the resin on a 4 inches wafer.
- The temperature ramp enables to reduce the mechanical stress inside the resin layer.
- The programmable tools enables to do long resin bakes without staying front the device.

## Safety & protection

- Walk-away timer shuts off heating after a preset userdefined interval.
- A hot top warning might protects from accidental burns when heating surface is above 50°C (122°F).

## Warranty

Warranty 1 year.



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# ▶ SoftLithoBox®

## Digital hotplate

▶ FEATURES

## Digital hotplate

Ensure accurate and stable temperature set points with micro-processor-controlled. Digital Hotplate, which feature electronic feedback. An aluminum top for a better temperature homogeneity. The device enables to do temperature ramp for heating and cooling down. Make your life easier with its programmable controls.



▶ SPECIFICATIONS

Weight	8kg (17,6 lbs)
Power	600 W
Power supply	110V or 230V 50/60 Hz
Dimensions (HxWxD)	150x250x350 (in mm)
Heating Surface Area	204x204 (in mm)
Top plate Material	Aluminum
Temperature range	Ambient +1°C to 450°C
Temperature resolution	1°C

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## Majors strengths

- Compact tool easily movable.
- Short vibration orbit..
- Adjustable agitation frequency.
- Easy of use.

## A device adapted for Soft-lithography applications

- Enables a control and repeatable development of your photoresist.
- Its short vibration orbit enables a homogenous and perfect development and to remove bubbles that can be trap close to the design.

## Safety & protection

A large selection of attachments enables to use various vessels and sizes without any risks.

## Warranty

Warranty 3 years.



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## Developer agitator

▶ FEATURES

### Developer agitator system

This tool is a vibrating agitator, electronically regulate it allows smooth to ridged mixing of viscous media and solids.

Already used by different laboratory for microfluidic application, it enables an easy photoresist development.



▶ SPECIFICATIONS

Weight	5.5kg ( 12.1lbs)
Power	31 W
Power supply	110V or 230V ; 50 Hz
Dimension (HxWxD)	125x245x310 (in mm)
Weight capacity	2 kg
Vibration orbit	3 mm
Speed	From 150 to 1350 rpm
Vibration time	From 1 to 120 minutes
Size plate	220x220 (in mm)

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## Major strengths

- Vacuum pump optimized for the device included
- Three RF power available
- Can mix two different fluids
- Numeric vacuum gauge
- Fine vacuum tuning
- Compatible with 3,4 ,5,6 inch wafer

## A device adapted for Soft-lithography applications

- The device has been specially optimized for PDMS bonding, with glass or PDMS.
- It is working with air and so do not need more facility than an electric plug for power.

## Safety & protection

The plasma cleaner is designed for safe and efficient operation when used properly.

## Warranty

Warranty 1 year.



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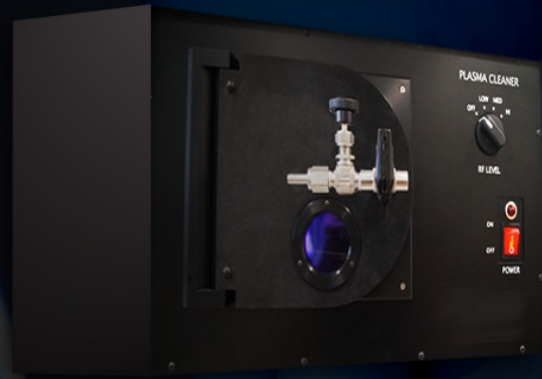
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## PLASMA CLEANER System

▶ FEATURES

### PLASMA CLEANER

The plasma is create by a radio frequency (RF) oscillating electric field. This device allows you to do the principals in-teraction with a surface: ablation, chemical etching, activation, deposition and cross-linking.



▶ SPECIFICATIONS

#### Plasma cleaner specifications

Weight	20,5 kg (45 lbs)
Power	373 W
Power supply	110V or 230V ; 50/60 Hz
Dimension (HxWxD)	280x460x230 (in mm)
Pressure range	From 300 to 1500 mTorr
RFpower	Low (7.2 W ) Med (10.2W) Hi (29.6W)
Chamber dimension (diamxD)	∅152x175 (in mm)

#### Vacuum pump specifications

Weight	12.3 kg (27 lbs)
Power	373 W
Power supply	115V or 230V ; 50/60 Hz
Dimension (HxWxD)	248x356x140 (in mm)
Air flow	5.1 m <sup>3</sup> /hour

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## Major strengths

- Easy to use
- Own two internal shelves
- Light warning during heating
- Timer goes from 1 to 120 minutes
- Sized for a mold
- Internal chamber in aluminum for a better heat diffusion
- Adjustable flow air going inside the chamber for venting

## A device adapted for Soft-lithography applications

- Size adapted to size of a Petri dish to heat two molds at one time but with the minimum place and electric consumption.
- It is pre-heated rapidly.
- It is a really movable device and can be install everywhere.

## Safety & protection

- The level protection is IP40.
- The quality of the product is certified at an international level.

## Warranty

Warranty 1 year.



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# ▶ SoftLithoBox®

## Oven

▶ **FEATURES**

## Oven

Natural convection drying ovens with notable thermal stability. Frontal panel with bimetallic fluid expansion probe thermo regulator. This oven sized for 4 inches wafer will allow you to cure your PDMS efficiently.



▶ **SPECIFICATIONS**

Weight	10 kg (22 lbs)
Power	360 W
Power supply	110V or 230V; 50/60 Hz
Dimensions (HxWxD)	380x240x300 (in mm)
Internal dimension (HxWxD)	190x150x190 (in mm)
Temperature range	Ambient +1°C to 150°C
Temperature resolution	3°C
Volume	5.4 liter

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## Major strengths

- Enables to clean, solve, mix and degas
- Degas function key
- Powerful ultrasonic transducer systems
- Really week electric consumption
- Easy to use
- Programmable timer

## A device adapted for Soft-lithography applications

- Its little size enables to install it everywhere and it is adapted to clean usual PDMS chip.
- Really efficient to clean PDMS chip and even inside tiny connection holes, to remove dust and PDMS particles.

## Safety & protection

- Automatic stop at the timer end and limit of 12 working hours.
- Cover to limit the noise.
- Basket or containers to hold objects during the cleaning and not holding them by hand.

## Warranty

Warranty 1 year.



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## ▶ SoftLithoBox®

### Ultrasonic bath

#### ▶ FEATURES

## Ultrasonic bath

The cleaning by ultrasound is the most modern fine cleaning method. The electric high-frequency energy created by an ultrasonic generator is transformed into mechanical energy by piezo-electrical transducer systems and then transmitted into the bath.



#### ▶ SPECIFICATIONS

Weight	2.0 kg (4 lbs)
Power	240 W
Power supply	110/120 - 230V; 50Hz
External Dimensions (HxWxD)	180x210x120 (in mm)
Internal Dimensions (HxWxD)	60x190x85 (in mm)
Frequency	37 kHz

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## Majors strengths

- A perfectly monochromatic exposure over the wafer surface area, with a bandwidth lower than 10 nm.
- Cold UV exposure.
- Divergence angle of the light  $< 2^\circ$ .
- A strong power density.
- Long LED lifetime : more than 10 000 hours equivalent to 8-10 years of use.
- User-friendly touch screen interface for exposure cycles programming (continuous or cyclic exposure).
- No warm-up time required.
- Computerized control of UV source intensity adjustment is intuitive and straight forward.
- Automated wafer loading and unloading system.
- Low power consumption.
- Usable with glass and plastic mask.

## A device adapted for Soft-lithography applications

- With  $2\mu\text{m}$  resolution, the device is particularly well tuned for softlithography applications.
- The exposure in flash mode enables to reduce the internal mechanical stress.
- Its little size enables to install it everywhere you want, especially out side a clean room.

## Safety & protection

The device is not heating and the UV light is kept inside without injuring for the user.

## Warranty

Warranty 1 year.



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# ▶ SoftLithoBox®

## UV LED Exposure and Masking System

▶ FEATURES

### UV LED system

This UV system is a UV LED exposure and masking system with available light sources at wavelengths of 365 nm or 385 nm.

This is a very compact table-top system capable of exposing a wafer surface area of up to 4 inches in diameter. This UV system is compatible with hard (physical) or soft (proximity) masking contacts, and features variable mask to substrate distance control.



▶ SPECIFICATIONS

Weight	8,2 kg (18 lbs)
Power	180 W
Power supply	110V or 230V ; 50 Hz
Dimension (HxWxD)	260x260x260 (in mm)
Emission spectrum	365 nm $\pm$ 5 nm / 385 nm $\pm$ 5 nm
Resolution	2 $\mu\text{m}$
Illumination UV power	23,2 mW/cm <sup>2</sup> $\pm$ 10%
Exposure time	From 1s to 18 hours
Time resolution	1s
Number of memorized cycles	10

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## Major strengths

- Dry and clean air
- Really quiet functioning
- Long-life (around 35 000 hours)
- Really week electric consumption
- Little and powerful
- Easy maintenance

## A device adapted for Soft-lithography applications

- Its little size and its little noise enables to install it everywhere without bothering users.
- The vacuum level is enough to maintain a wafer on the spin coater chuck or to degas PDMS under 30 minutes.

## Safety & protection

- There is no risk to use this vacuum pump if following the right instructions.
- The plastic legs limit the vibration for other devices around.

## Warranty

Warranty 1 year.



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# ▶ SoftLithoBox®

## Vacuum pump

▶ FEATURES

## Vacuum pump

The linear diaphragm vacuum pump is really compact and based on the electromagnetic oscillation principle. This technology using electromagnet has many advantages, first there is few friction and so need a low electric consumption and second the life time is really long, around 35 000 hours without maintenance.

This device is really remarkable by its low noise.



▶ SPECIFICATIONS

Weight	1.9 kg (4.4 lbs)
Power	30 W
Power supply	110-120-230V; 50/60 Hz
Dimensions (HxWxD)	168x80x75 (in mm)
Normal pressure	- 61.2 kPa
Air flow	4 l/min
Noise level	< 40 dBA

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## Major strengths

- Ultra-quiet
- Long-life
- Easy to operate and minimum maintenance
- Handy and easily portable
- Anti-corrosion treated valve plates
- Best-in-class, long-life synthetic oil

## A device adapted for Soft-lithography applications

- With a minimum air flow of 1 l/min and a pressure of 8 bar it will totally fit to supply your spin coater or your air gun.
- Its little size and its little noise enables to install it everywhere without bothering users.
- The add of a air and oil filter protect the wafer of oil residue and particle pollution.

## Safety & protection

- A safety valve prevents the pressure to go over 16 bar.
- The vessel can resist at a pressure of 24 bar.

## Warranty

Warranty 2 years.



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# ▶ SoftLithoBox®

## Air compressor

### ▶ FEATURES

## Air compressor

This lubricated air compressor is very easy to operate. It is little and noiseless and so really discreet. Made as much for industrial application as laboratory, it is a really versatile tool.



### ▶ SPECIFICATIONS

Weight	18 kg (39.6 lbs)
Power	350 W
Power supply	120V or 230V 50/60 Hz
Dimensions (HxWxD)	380x333x342 (in mm)
Volume tank	4 L
Maximum pressure	8 bar (120 PSI)
Airflow	From 1 l/min to 20 l/min
Noise level	< 35 dBA

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