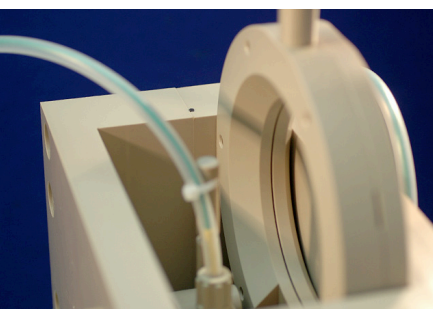
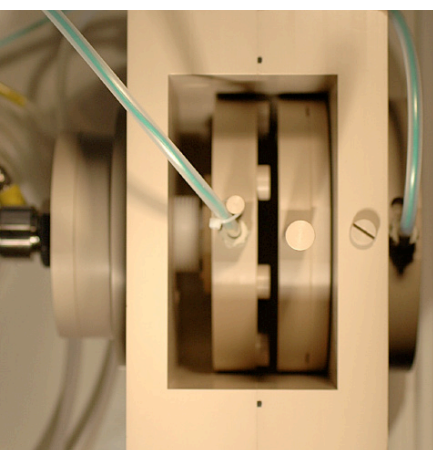
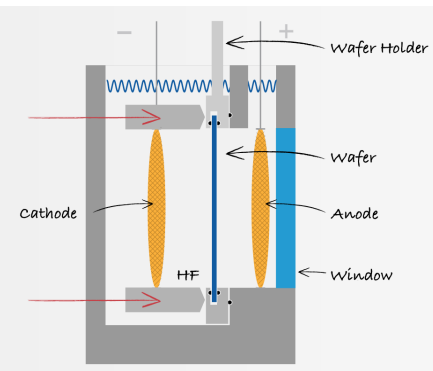


WET ETCHING SYSTEM FOR POROUS SILICON (MPSB)

DOUBLE CELL HF TANK FOR POROUS SILICON ETCHING WITH ELECTROLYTICAL BACKSIDE CONTACT



Schematic diagram of the MPSB double cell wet etching system



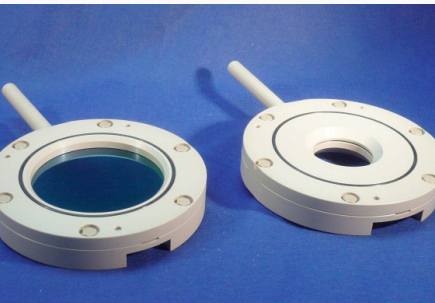
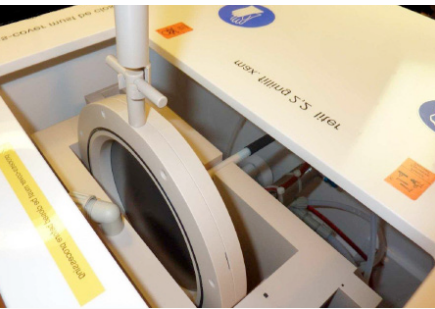
The MPSB wet etching system for porous silicon is a complete solution for porous silicon formation and electropolishing of silicon. Together with our Porous Silicon Power Supply PS2, AMMT offers an all-in-one solution for this range of fabrication methods. The MPSB is available for 4", 6" and 8" wafer sizes. For safety purposes, the bath is equipped with connections for continuous HF vapor extraction. PTFE drain valves are connected for direct HF disposal. As an option, an optical windows allows for light-assisted porous silicon formation. An HF resistant sapphire window, supported by thick quartz disks as protection against fracture, can be mounted into sealed flanges. If illumination is not necessary, blind PP covers can be mounted instead.

The wafer is mounted into a removable wafer holder, which is sealed with double O-rings. The wafer holder is then placed in front of the circular opening in the separation plate and is finally fixed in place by a pneumatic actor driven catch. Once the catch is closed, both HF compartments are electrically insulated in the MOhm-range. Two platinum mesh electrodes, one in each cell, are used to contact the wafer from both sides. In order to ensure a homogeneous electrical field, the electrodes are of the same size as the wafer. If a completely metal-ion free environment is required, the Pt electrodes can optionally be replaced by Si sacrificial electrodes. The HF liquid can optionally be re-circulated by a PTFE membrane pump. This circulation loop also allows for HF cooling by means of an in-loop heat exchanger.

TECHNICAL SPECIFICATIONS

Product code	MPSB 100	MPSB 150	MPSB 200
Wafer size	100 mm (4") or smaller	150 mm (6") or smaller	200 mm (8") or smaller
Etchant Volume			
Tank volume only <i>options results in additional volume</i>	~1,4 litre	~2,5 litre	~3,8 litre
Safety receptacle external dimensions			
Width x Height x Depth with vapor extraction	440 x 450 x 440 mm ³	440 x 450 x 440 mm ³	480 x 570 x 480 mm ³
Separation plate	This cell separator plate divides the bath into two chambers and has a circular opening of		
	Ø 92 mm	Ø 142 mm	Ø 189 mm
Electrical isolation between chambers	> 10 ⁵ Ω when bayonette catch is closed with isolating wafer substitute		
Standard Wafer holder			
Edge exclusion area	7 mm	10 mm	9 mm
HF exposed area	86 mm	130 mm	182mm
Electrodes (2)			
Size (diameter)	90 mm	140 mm	190 mm





MPSB WAFER HOLDERS

Product code		MPSB 100		MPSB 150		MPSB 200	
Distance between wafer and electrode							
		<i>Si</i>	<i>Pt</i>	<i>Si</i>	<i>Pt</i>	<i>Si</i>	<i>Pt</i>
Processing Side (Left / Anode)		29 mm	35 mm	48 mm	54 mm	46 mm	55 mm
Electrolytical Contact Side (Right / Cathode)		58 mm	52 mm	48 mm	54 mm	46 mm	55 mm
Material	w/ optical window	Platinum meshed electrode (Pt/Ir) in a PEEK frame					
	w/o optical window	Platinum (Pt) plate in a PEEK frame or Silicon sacrificial electrode					
Optical window (optional, Plus system only)							
Size		Ø 93 mm		Ø 130 mm		Ø 189 mm	
Material		1 mm sapphire window backed with quartz disk					
Connections							
Fluidic drain		PTFE hose (ID: 6mm OD: 8 mm)					
Air pressure		6 bar					
Etchant compatibility		HF and HF-ethanol mixtures					
Temperature range		10 °C – 30 °C					

Besides regular wafer holders for 2", 3", 4", 5", 6" and 8" wafers we also offer unique wafer holder for the porous silicon system.

» Test wafer holder

The test wafer holder allows to perform up to five etches on a single wafer thus helping to increase the speed of development of a set of parameters.

» Chip holder

Individual chip holders can be manufactured customer specifically for almost any chip size.

OPTIONS

» Silicon electrodes

For processes which have to remain fully free of metal ions the Pt electrodes can be replaced by Silicon sacrificial electrodes.

» HF circulation

Etchant circulation by means of a PTFE membrane pump. For systems with Silicon sacrificial electrodes both half cells are equipped with separate electrically insulated circulation loops.

» HF cooling

For long process durations or especially high currents it maybe required to cool the HF etchant. A heat exchanger can be inserted into the HF circulation loop.

» Sapphire window:

For light assisted porous silicon formation, a sapphire window backed by a quartz disk can be mounted behind the Pt-mesh electrode (Anode).

NOTE: Hydrofluoric acid (HF) is an extremely dangerous substance to work with. Special care has to be taken when installing, maintaining and operating this system. In particular, a secure mount of the device and an appropriate vapor extraction has to be assured. AMMT can provide information about the installation and operation of the MPSB, but will not assume any responsibility for harm or damage caused by using this product.