

MakroPor

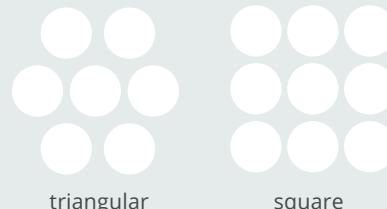
Macroporous Silicon FactSheet

PORE GEOMETRIES

The planar pore geometry can be predefined so that periodic arrangements as well as more complex structures including trenches and cavities can be formed.

Without prestructuring, the pore arrangement is driven by self organization. Due to the fixed pore distance, the size and distance distribution is more precise for the predefined structures.

strictly ordered

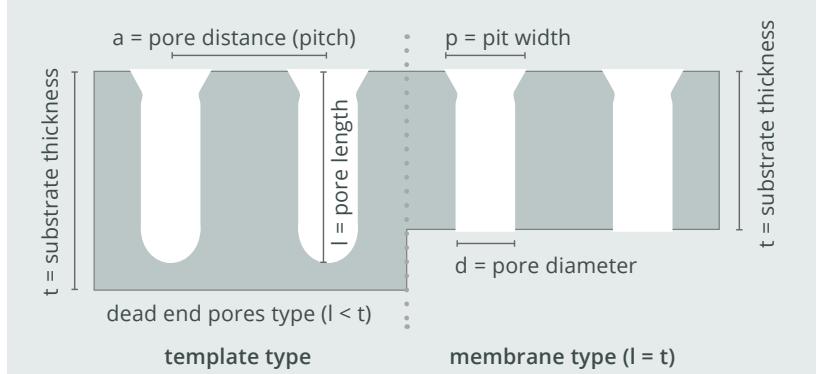


STANDARD PARAMETERS

A funnel shaped pore entrance followed by a small bottleneck (length in the range of the pore diameter) will be formed on top of the pore structures.

Two types of structures are available:

- **template type** („dead end-pores“ inside bulk silicon substrate)
- **membrane type** (both sides open „through-pores“)



TECHNICAL DATA

Pore geometry	trigonal, square, custom defined lithography
Pore distance (a)	standard stock material: $a = 1.5 \mu\text{m}$, $4.2 \mu\text{m}$ trigonal lattice, $a = 12 \mu\text{m}$, $20 \mu\text{m}$ square lattice
Pore diameter (d)	$1 - 17 \mu\text{m}$
Porosity (p)	$15 - 65 \%$
Pore length (l)	$10 - 500 \mu\text{m}$ (depending on substrate thickness)
Chipsize	up to 6" diameter, custom sizes/shapes via laserdicing, small scale custom process development possible

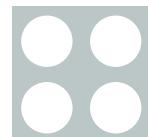
POSTPROCESSING

Different optional post processing steps available:

Substrate liftoff for the generation of both side opened membranes, anisotropic pore shaping and laser dicing.



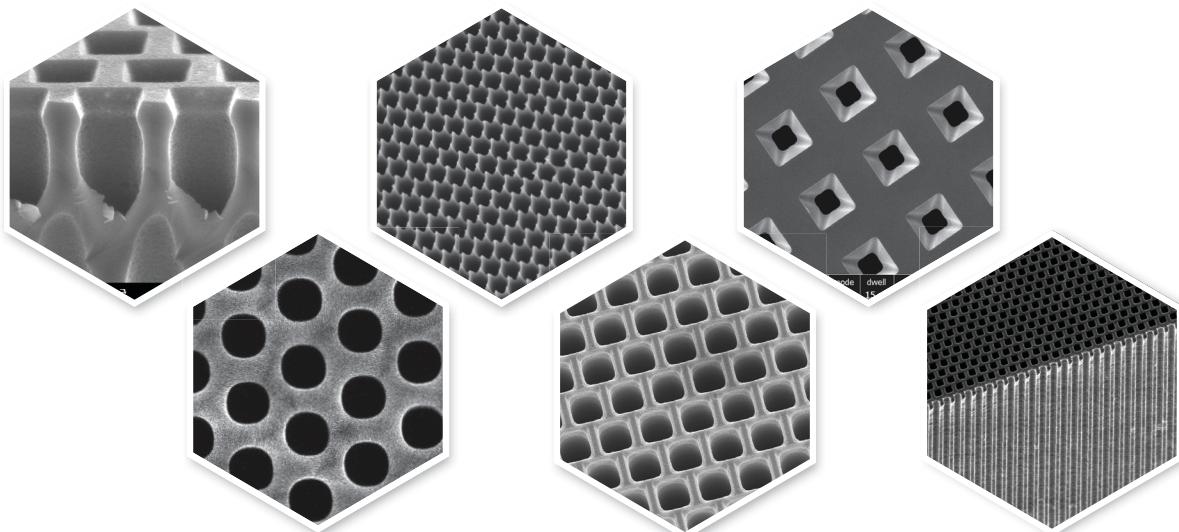
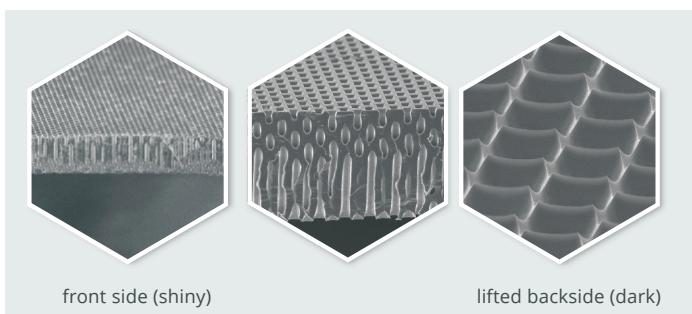
laserdicing



anisotropic pore shaping


STANDARD STOCK MATERIAL – DETAILS

	MarkoPorP1.5	MarkoPorP4.2	MarkoPorP12	MarkoPorP20
Interpore distance	1.5 µm	4.2 µm	12 µm	20 µm
Pore diameter	1 µm	2.5 µm	5 µm	8 µm
Widening, upon request	not available	not available	up to 10 µm	up to 17 µm
Pore arrangement	trigonal	trigonal	square	square
Porosity	40 %	30 %	15 - 60 %	15 - 65 %
Membrane thickness, standard	50, 100, 200 µm (lift off)	50, 200 µm (lift off)	50 (lift off), 350, 500 µm	500 µm
Membrane thickness, upon request	25 – 200 µm	25 – 200 µm	200 – 500 µm	200 – 500 µm
Template length	10 - 300 µm (525 µm total)	10 - 500 µm (525 µm total)	30 - 500 µm (525 µm total)	30 - 500 µm (525 µm total)
Sample size	up to 6" wafer with 130 mm porous area	up to 6" wafer with 130 mm porous area	up to 6" wafer with 130 mm porous area	up to 6" wafer with 130 mm porous area
Standard tolerances of ± 10 %	✓	✓	✓	✓


APPEARANCE AND DIMENSIONS

THIN FREE STANDING MEMBRANES BY DIRECT LIFT OFF DURING PORE ETCHING

front side (shiny)
lifted backside (dark)

Lifted backsides are sensitive to mechanical handling. Abrasion of silicon nanotips is visible as brown "scratches" on the surface but have minor effect on the underlying pores.

We suggest using vacuum tweezers on the front side or polymer tweezers on the side faces.