Soft litography with Polydimethylsiloxane (PDMS) and plasma bonding

Aim of the procedure

This protocol describes the creation of a PDMS positive from a (reusable) 3D printed negative, as well as the plasma bonding of two or more PDMS parts

Material

- Sylgard 184 silicone elastomer kit
- 3D-printed negativ

Procedure

Soft litography with PDMS

1. Smooth surface of 3D-printed negative with sand paper or solvent.
2. Create a shell with high edges using aluminium foil for the negative.
3. Weigh in the required amount of elastomer and curing agent (weight ratio 10:1).
4. Mix elastomer and curing agent.
5. Pour mix on the negative in the shell.
6. Treat the filled shell in an desiccator.
7. Optional: heat to 70 °C for 60 min for faster hardening – only works if negative material is resistant to heat (e.g. polycarbonate).

Plasma bonding

1. Clean the PDMS parts, e.g. with a sonicator.

2. Treat the parts in a plasma cleaner.
3. Quickly join the surfaces and compress for 15 s.
4. Heat to 70 °C for 60 min.