2 Fluidic Connectors

2.1 Luer

These devices can be mounted on the fluidic chips and are compatible with standard male Luer and Luer Lok adapters as, e.g., used for syringes. The diameter of the through hole is 1.3mm.

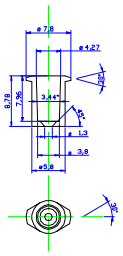
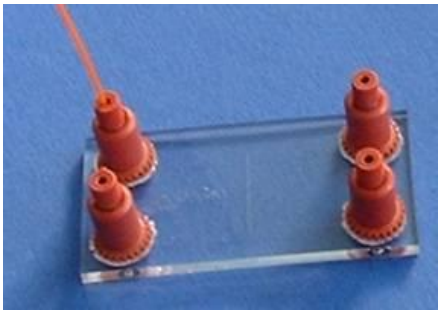


Fig. 21: Schematic drawing of the adapter

Fig. 22 & Fig. 23: Luer Lok compatible adapter

2.2 Upchurch Nanoports

The Upchurch Nanoports N-126H allow for chip holes up to 1/16'' (1.57 mm) and for tubings with an outer diameter of 1/32'' (0.79 mm). They can be used with capillary peek tubings with an outer diameter of 1/32''. Please be aware when you make your fluidic design that the footprint of these Nanoports is 8.4 mm.



Fluidic Connectors

Fig. 24: Upchurch Nanoports (left) and fluidic chip with mounted Nanoports (right).

3 Fluid Storage

3.1 Tank

One often existing problem in microfluidics is the storage of liquid reagents on the chip. This often is in conflict either with dry-stored reagents on the chip, the available space or volume or the desired chip material. For this reason, *microfluidic* has developed a system which allows to store liquids in separate tanks which are simply plugged onto the chip. The tank, which exists in single, double and triple tank versions (see Fig. 25), has a volume of 500 µl and is 25 mm high. The openings are sealed with a heat-sealing aluminium foil which is pierceable. Liquid actuation is performed either by a mechanical piston or pneumatic pressure.

Fig. 25: Single, double and triple tanks

Fig. 26: Tanks filled and sealed with aluminium foil

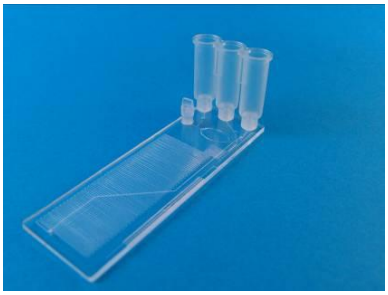


Fig. 27: Tanks mounted on chip

3.2 Blister Pouches

A convenient method to store liquids on-chip is the use of blister pouches made out of a coated aluminium foil. They are available in a variety of sizes with internal volumes up to 500 µl.

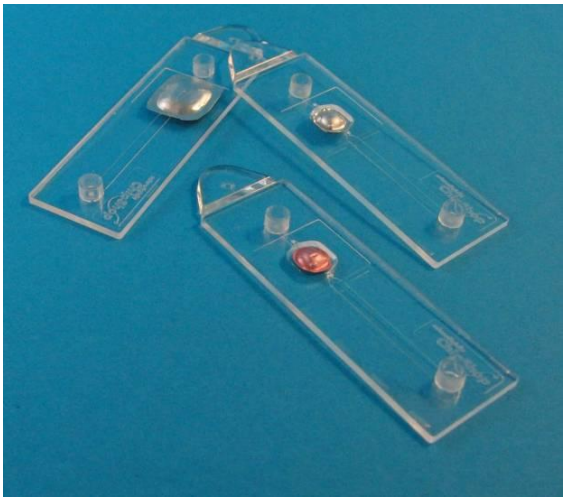


Fig. 28: Blister pouches with volumes of 40 - 200 µl on a microscopy slide chip

4 Materials

All the platforms are available in a wide range of thermoplastic materials like PMMA, PC, PS, COC or COP, to name just a few. Also, different grades of each material are available. It is one part of *microfluidic* service to help our customers in the selection process of the best suitable material, taking into account the requirements arising from the application as well as issues of manufacturability and cost. Low autofluorescence as well as a high UV transparency materials are available.

5 Formats – Some Simple Examples

5.1 Single Channel Chip

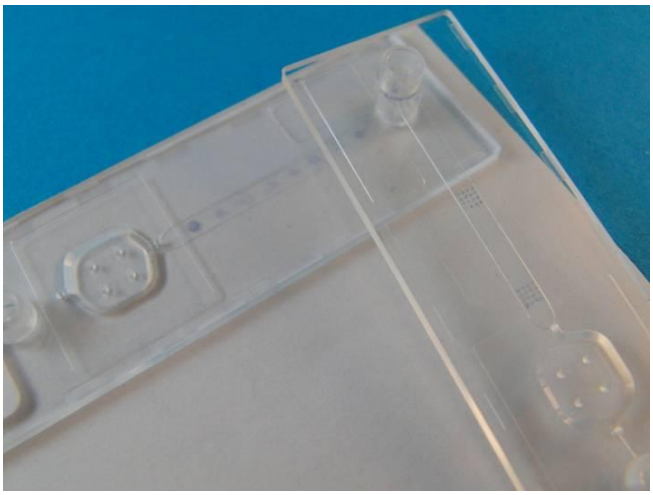


Fig. 29: Single channel chip with Luer-like interfaces. This chip contains a waste chamber and a long, wide channel which can be spotted with DNA-probes for hybridization experiments.

5.2 Diagnostic Platform

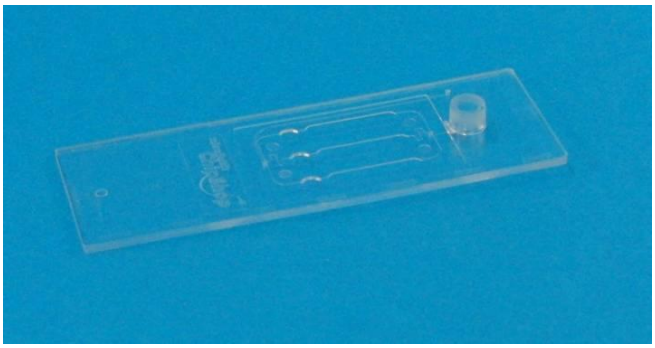


Fig. 30: Platform for the development of diagnostic assays involving whole blood like agglutination assays. The chip contains Luer-connectors and three identical fluid pathways leading to antibody-filled reaction chambers.

5.3 Integrated Continuous Flow PCR Chip

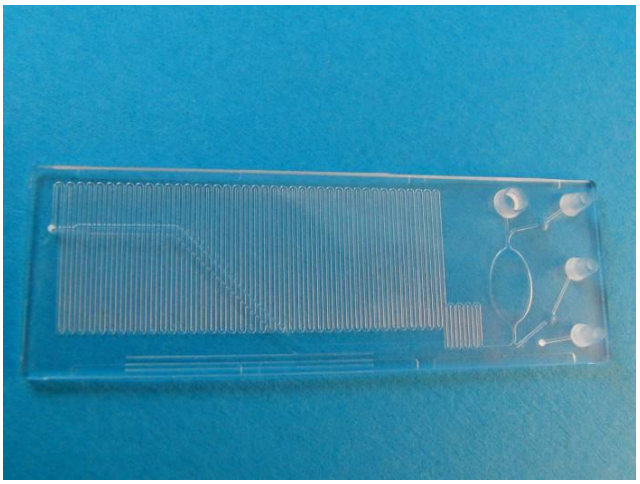


Fig. 31: Chip for continuous flow PCR with fluidic elements for sample preparation including lyophilisate storage on-chip.

5.4 18-Well Microtiter Plate – Slide Format

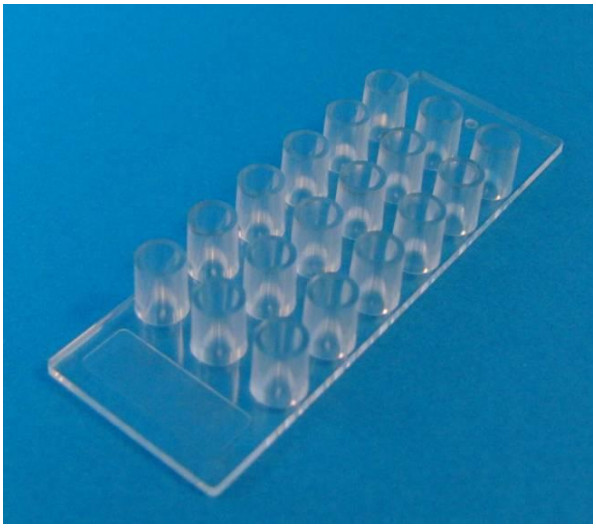


Fig. 32: 18-well plate with a 3 × 6 well array on a microscopy slide format.

6 Accessories

In order to facilitate design and use of our platform chips, several accessories exist.

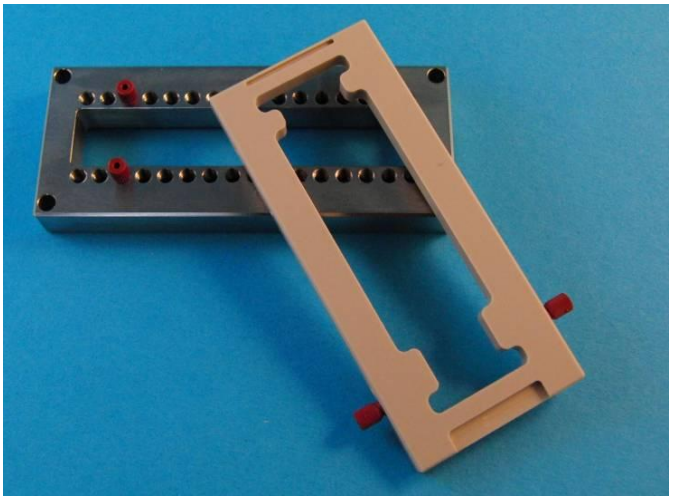


Fig. 33: Holders for the microscopy slide platform with holes as fluidic ports. The holders are made out of stainless steel or PEEK and connect the holes to HPLC-tubing.

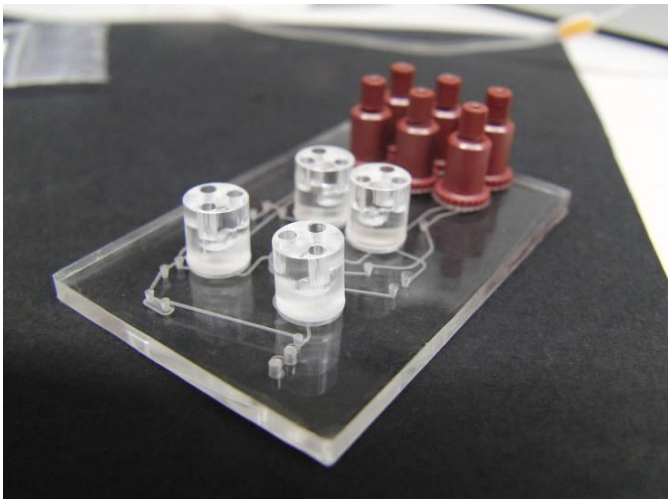


Fig. 34: In order to realize more complex fluidic functions on a chip, turning valves with functionality similar to an HPLC-valve can be used. The valves are manufactured using two-component injection molding and can connect up to 7 different channels as well as act as a metering valve.