Supplementary Material (ESI) for
Lab on Chip

Supporting Information

Connecting microfluidic chips using a chemically inert, reversible, multichannel Chip-to-World-Interface

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Supplementary figures

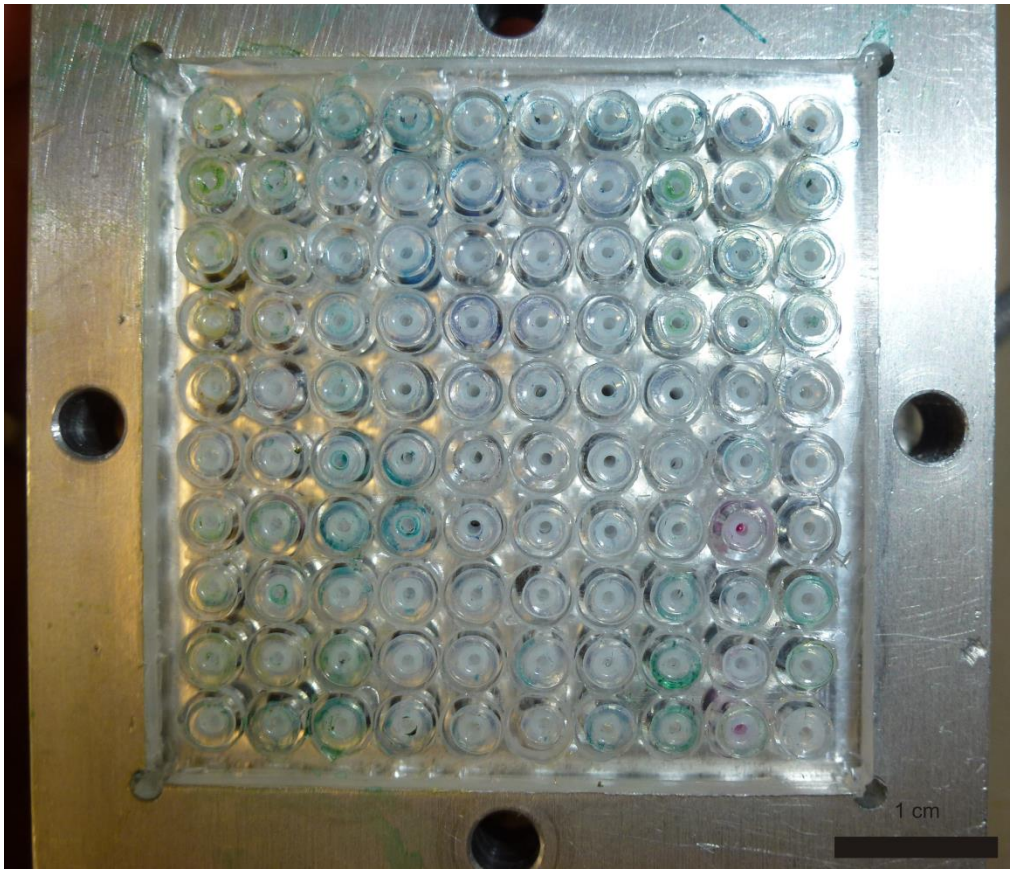

Fig. S1 CWI100 used for solvent testing. For solvent testing the syringe pump was connected to one of the PTFE tubes of the CWI100 (a different tube for each solvent). One by one individual channels were probed with organic solvents (water, EtOH, DMF, DEE, DCM, THF, tetradecane, xylene or tetrachloroethylene) at a flow rate of 20 µl/min for 8 hours. After the test the CWI was disconnected from the setup. As depicted the CWI100 (compression element and tubes) is intact, whereas the microfluidic chip that was used during this experiment was seriously damaged (see Fig. 3h).

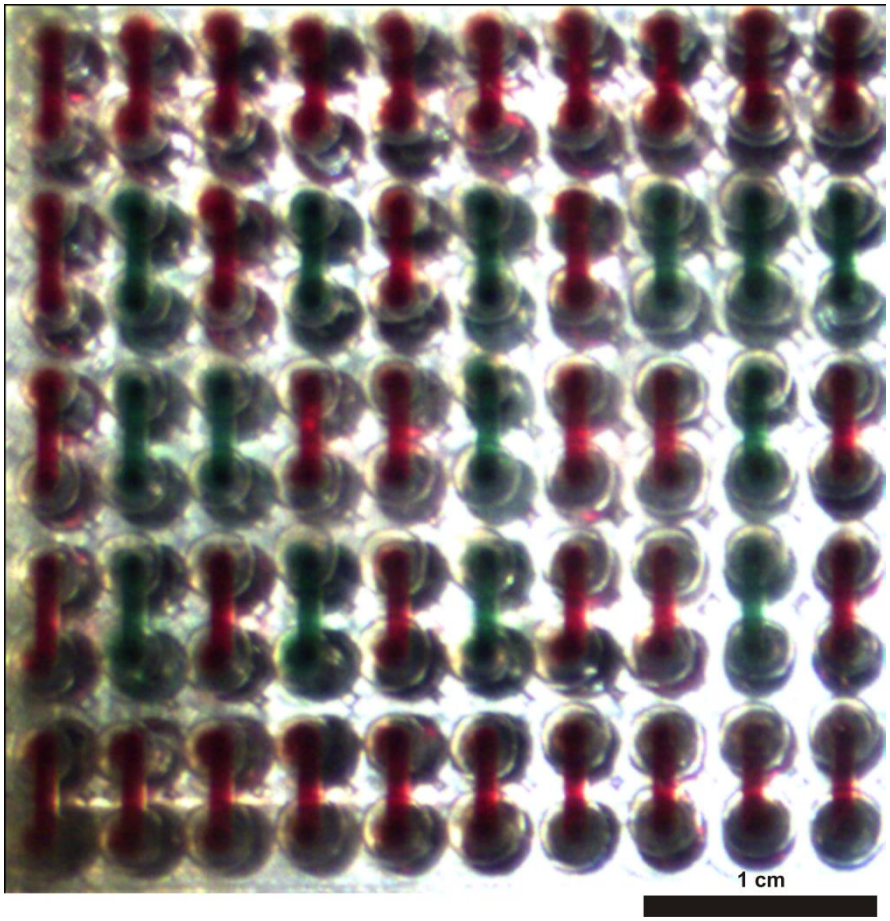

Fig. S2 Close-up of a microfluidic chip connected to a CWI100. The microfluidic chip connects pairs of inlets by a short channel segment. The chip was filled with dyed water in red and green pressurized at 500 kPa. As depicted no leakage could be observed at the individual connections.

Supplementary mechanical drawings

We included all mechanical drawings that are necessary for reproducing a CWI100 and a CWI20. Files are included in three formats: SolidEdge 2D drawings (*.dft), 3D CAD (computer aided design) models (*.stp) and the drawings as plain pdf-files. The components labeled “bottom_plate_mold”, “compression_ring_mold” and “compression_backplane_mold” are required for setting up the mold for the compression element. They should be manufactured from of metal e.g., aluminum. For completing the mold 4 M4 screws and 100 small pieces of PTFE tube (outer diameter 1.6 mm, each about 2 cm long) are also required. The mold can be used for every CWI. After demolding the compression element can be cut into pieces of the size required for the specific CWI.

For setting up a complete CWI one compression element (casted in PDMS using the mold) and an aluminum frame for the CWI are required. We included mechanical drawings of the aluminum frame for a CWI20 (“aluminum_frame_CWI20”) and a CWI100 (“aluminum_frame_CWI100”) in the ESI.

For using CWI20s either as distributor or as connector the distributor chip (“distributor_chip”) or the connector chip (“connecter_chip”), respectively, has to be manufactured by stereolithography. The respective chip is then inserted in an aluminum frame (“aluminum_frame_connector_chip”).