

Abstract Submitted  
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**Integrated high pressure manifold for thermoplastic microfluidic devices** S.ALI AGHVAMI, SETH FRADEN, Brandeis University — We introduce an integrated tubing manifold for thermoplastic microfluidic chips that tolerates high pressure. In contrast to easy tubing in PDMS microfluidic devices, tube connection has been challenging for plastic microfluidics. Our integrated manifold connection tolerates 360 psi while conventional PDMS connections fail at 50 psi. Important design considerations are incorporation of a quick-connect, leak-free and high-pressure manifold for the inlets and outlets on the lid and registration marks that allow the precise alignment of the inlets and outlets. In our method, devices are comprised of two molded pieces joined together to create a sealed device. The first piece contains the microfluidic features and the second contains the inlet and outlet manifold, a frame for rigidity and a viewing window. The mold for the lid with integrated manifold is CNC milled from aluminium. A cone shape PDMS component which acts as an O-ring, seals the connection between molded manifold and tubing. The lid piece with integrated inlet and outlets will be a standard piece and can be used for different chips and designs. Sealing the thermoplastic device is accomplished by timed immersion of the lid in a mixture of volatile and non-volatile solvents followed by application of heat and pressure.

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