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INFORMATION SHEET

| | | | |
|-----------|--------------------|-------------|-----------|
| Part name | Microreactor Chips | Part number | See below |
|-----------|--------------------|-------------|-----------|

Description

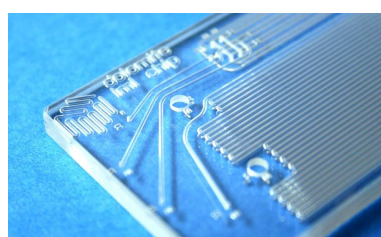
The Microreactor Chips are glass microfluidic devices designed for mixing and reaction of two or three liquid reagent streams. The main application is solution phase chemistry experiments including compound synthesis and reaction kinetics studies. The chips are supplied in a chip holder. A chip header is also available (3000261) allowing quick connection to 1/16" fluid pipes.



Left: 250 µl and 62.5 µl Microreactor Chips without holder

Below: 1 ml Microreactor Chip without holder

Below right: Microreactor Chip in holder and chip header (3000261)



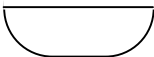
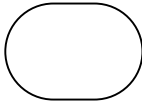

Benefits

- Rapid mixing across a range of flow rates
- High visibility (excellent access for optics)
- 2 or 3 inputs
- Quick connect/disconnect
- Wide temperature and pressure range
- Excellent chemical compatibility

General specification

| | Specification | Value |
|----|---|---------------------------------|
| 1 | Number of inputs | 2 - 3 |
| 2 | Number of outputs | 1 |
| 3 | Reaction volume | 62.5 µl, 250 µl, 1000 µl |
| 4 | Outside diameter of connection tubing | 1.6 mm (1/16 inch) |
| 5 | Inside diameter of connection tubing | 0.25 mm, 0.5 mm, 0.8 mm |
| 6 | Connection tubing material | PTFE, FEP |
| 7 | Surface roughness of channels (R _a) | 5 nm |
| 8 | Chip size | 90 mm x 28 mm and 90 mm x 45 mm |
| 9 | Chip thickness | 4.5 mm |
| 10 | Max operating temperature | 300 °C |
| 11 | Material | Glass |
| 12 | Fabrication process | HF etching and thermal bonding |

Performance and geometry information

| | Specification | Value | | |
|----|---|---|--|---|
| 1 | Chip type | 62.5 μ l Reaction chip | 250 μ l Reaction chip | 1000 μ l Reaction chip |
| 2 | Part number | 3000278 (2 - input) 3000279 (3 - input) | 3000280 (2 - input) 3000281 (3 - input) | 3000072 (3 - input) |
| 3 | Operating pressure | 30 Bar | 30 Bar | 30 Bar |
| 4 | Back pressure with 100 μ l/min flow (water) | 4 Bar | 0.25 Bar | 0.03 Bar |
| 5 | Mixing time | 6 seconds | 10 seconds | 10 seconds |
| 6 | Preheating of reagents prior to mixing | No | No | Yes |
| 7 | Channel Cross-section |  |  |  |
| 8 | Mixing channel depth | 85 μ m | 250 μ m | 300 μ m |
| 9 | Mixing channel width | 220 μ m | 300 μ m | 620 μ m |
| 10 | Mixing channel length | 532 mm | 532 mm | 2082 mm |
| 11 | Reaction channel depth | 85 μ m | 250 μ m | 600 μ m |
| 12 | Reaction channel width | 370 μ m | 400 μ m | 620 μ m |
| 13 | Reaction channel length | 1912 mm | 2509 mm | 1844 mm |

Custom options

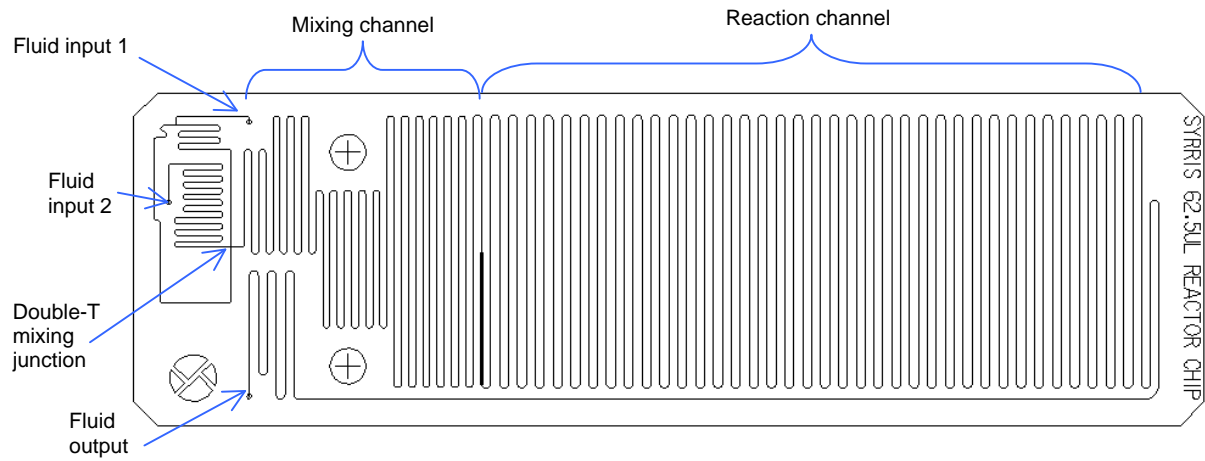
The microreactor chips may be customised in the following ways:

- Channel depth may be increased or decreased
- The chips can be made in quartz to improve UV light transmission
- Hydrophobic surface coatings can be applied to the inside surface of the channels
- Metals layers may be deposited on the inside surface of the channels, examples include platinum and gold layers

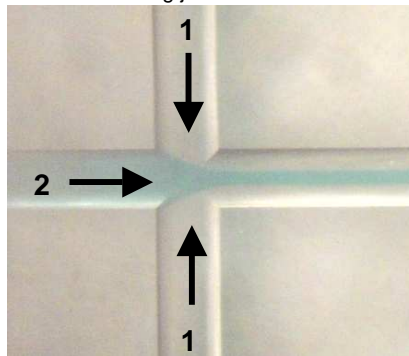


Microreactor Chip with metal layer on channel surface

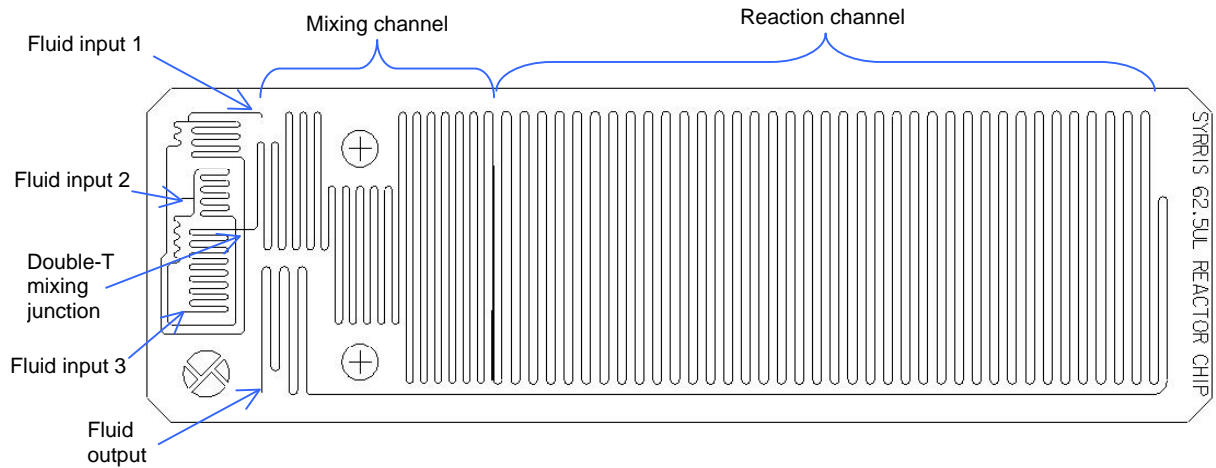
Channel layout for 62.5 μ l and 250 μ l 2-Input Reaction chips



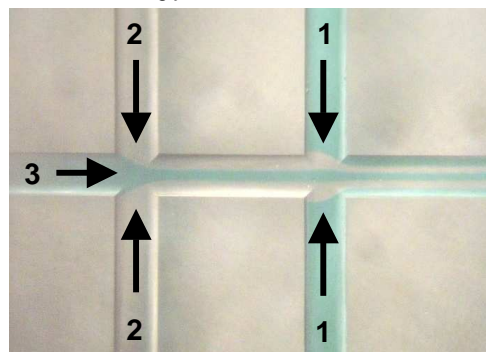
Double-T mixing junction



Channel layout for 62.5 μ l and 250 μ l 3-Input Reaction chips



Double-T mixing junction



Channel layout for 1 ml 3-Input Reaction chip

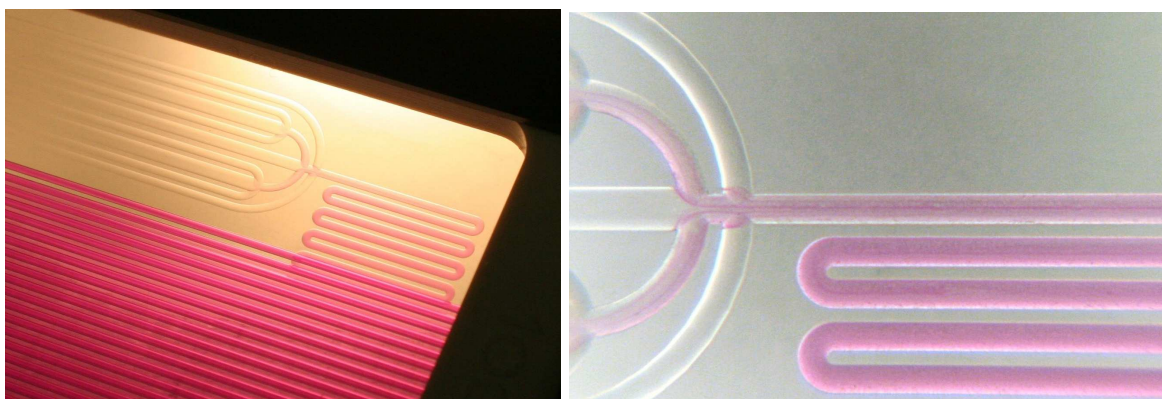
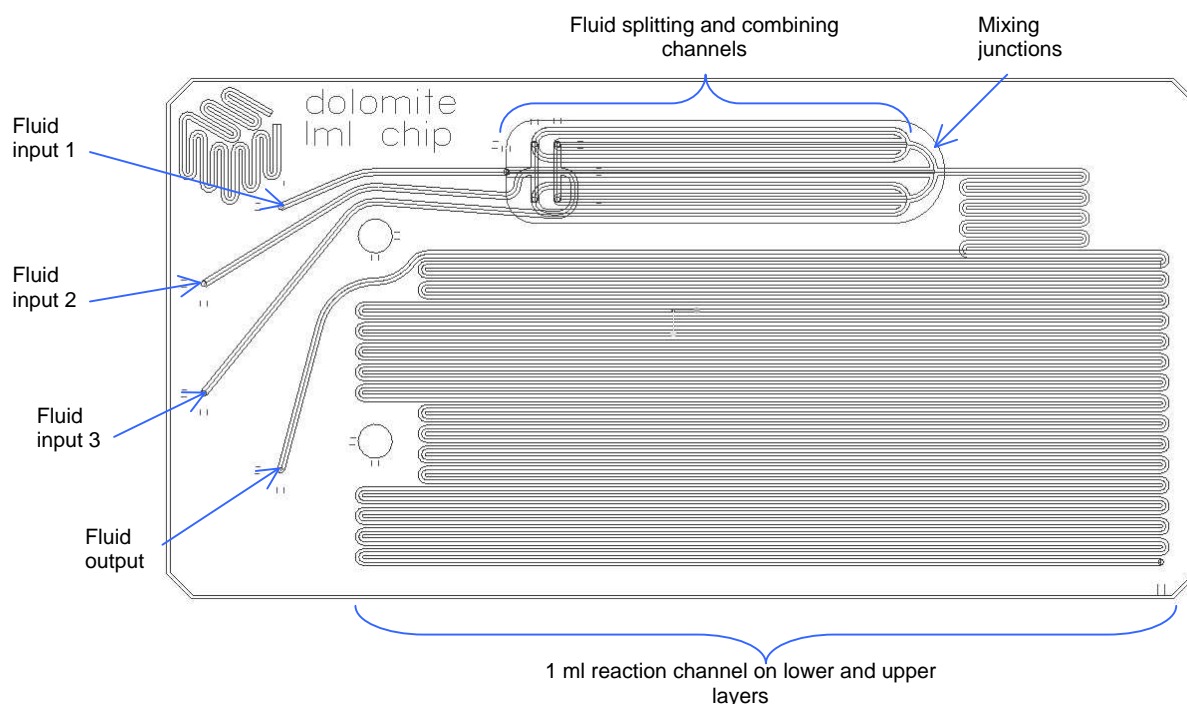


Figure 1 Mixing of 0.1 M NaOH with pH indicator in water

Mitos Reactor Chip Header (3000261) and other accessories

Mitos Reactor Chip Header (3000261): Enables the alignment and connection of all the input and output pipes to the Microreactor in seconds. The header is secured to the chip and holder by the two knurled thumb screws.

Chip Header Seal (3000262): Make the seal between the Microreactor and the input/output pipes held in the Mitos Chip Header. They are made of extremely chemically resistant fluoroelastomer (FFKM) and create a "zero" dead volume seal rated to 20bar (300psi).

Chip Header Blanking Plug (3000263): Used to seal off inputs to the chip. This enables a 3 input chip to be used with 1 or 2 inputs and a 2 input chip to be used with just 1 input. The blanking plug inserts into the Chip Header in place of an input pipe and should be used with a Chip Header Seal.



Left: Mitos Reactor Chip Header (3000261)

Top Right: Chip Header Blanking Plug (3000263)

Bottom Right: Chip Header FFKM Seals x10 (3000262)

The reactor chip may be mounted on the Mitos Volcano Heating Module (3000284) as shown below. This is shown on a hotplate with temperature probe (3000222(US)), (3000223(UK)). The operating temperature range is room temperature to +300°C.

