

# Y Junction Chips



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Part name	Part number
Y-Junction Chip	3200008
Y-Junction Chip, hydrophobic	3200129

## Description

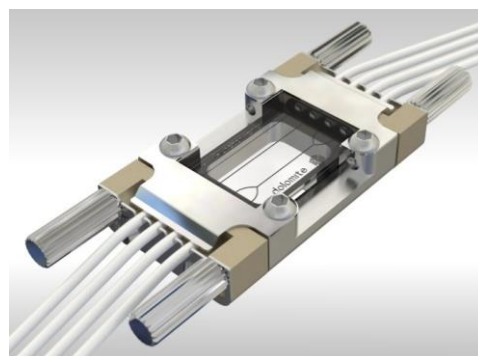
The Y-Junction Chip is a glass microfluidic device designed for a range of applications including Liquid-liquid contacting and molecular diffusion between parallel laminar flow streams. As well as two Y-junctions the chip also has two straight micro-channels for observation of fluid flow at micro-scale.

The Y-Junction Chip is designed to fit into the Chip Interface H (Part No. 3000155) with two Linear Connectors 4-way (Part No. 3000024).



**Left:** Y-Junction Chip (Part No. 3200008)

**Below:** Y-Junction Chip in Chip interface H (Part No. 3000155) with two Linear Connectors, 4-way (Part No. 3000024)



## Benefits

- Extremely smooth channel surface
- Wide temperature and pressure range
- Excellent chemical compatibility
- Quick connect/disconnect
- High visibility (excellent access for optics)
- Compact

## Specifications

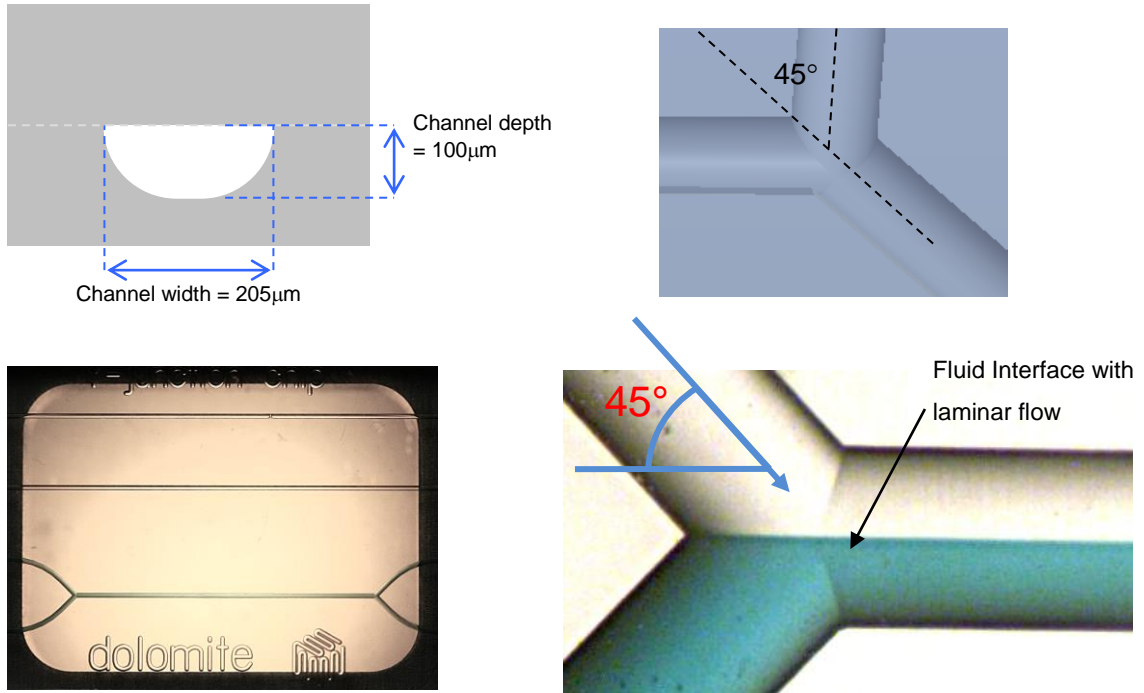
Chip Specification	3200008	3200129
Number of inputs	4	
Number of outputs	4	
Surface coating	No coating, hydrophilic	Hydrophobic
Internal channel cross-section	100µm x 205µm (depth x width)	
Channel length between Y-junctions	12.5mm	
Volume between Y-junctions	0.2µl	
Channel length of straight channels	22.5mm	
Volume of each straight channel	0.36µl	
Back pressure with 100µl/min flow (water) through one of the straight channels	0.05bar	
Surface roughness of channels (R <sub>a</sub> )	5nm	
Chip size (L x W x H)	22.5mm x 15.0mm x 4mm	
Chip top layer thickness	2.0mm	
Chip base layer thickness	2.0mm	
Surface roughness of channels (R <sub>a</sub> )	5nm	
Operating pressure	30bar *	
Operating temperature	-15 to 150° C **	
Material	Glass	
Fabrication process	HF etching and thermal bonding	
	None (Hydrophilic)	Hydrophobic***

\* Based on tests at 21°C

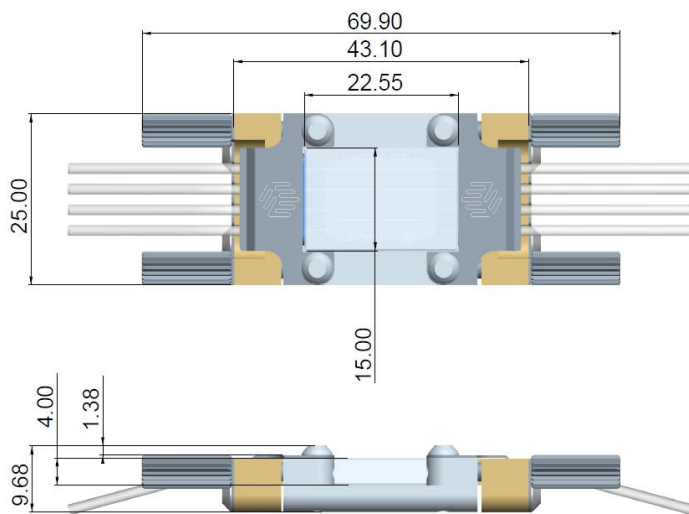
\*\* See specification for connector

\*\*\* The standard hydrophobic coating is not optimised for use with Picosurf 1 and 2 (fluorocarbon oils). If Picosurf is to be used we suggest using a fluorophilic coating on the channel surface.

## Channel Geometry



## Linear Connector Geometry



## Flow Characteristics

Inside the parallel flow area the different diffusion rates can be accurately controlled. Below are some photos of aqueous-aqueous diffusive flow over a range of flow rates (using syringe pump).

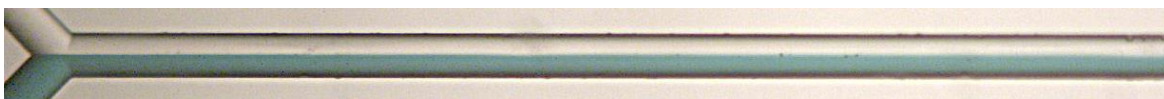
0.5ul/min:



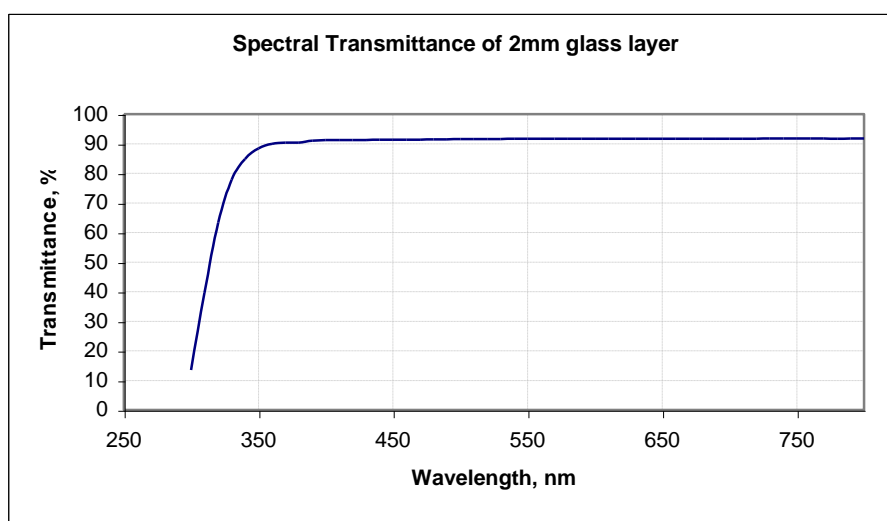
1.0ul/min:



5.0ul/min:



## Optical Transmission





## Custom Options

Dolomite offers a wide range of custom solutions including different channel depths and widths, as well as a variety of surface coatings. The Y-Junction Chips can be customised in the following ways:

### Etch depth

The channel may be etched to different depths, for example from 50 $\mu\text{m}$  x 105 $\mu\text{m}$  up to 350 $\mu\text{m}$  x 705 $\mu\text{m}$  (depth x width). The top layer can also be etched giving a circular channel cross-section.

Custom channel layouts can also be specified.

### Channel surface

The Y-Junction Chip can be supplied with hydrophilic or hydrophobic surface coatings, the chip can also be supplied with:

- Platinum or gold coating on channel surfaces



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