



# Multiflux™ Compatible Devices design guide



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## 1. Multiflux™

Multiflux™ is Dolomite's unique and flexible range of microfluidic connectors and interfaces allowing users to integrate their microfluidic devices into new and existing systems by creating fast and reliable multi-way connections between:

- Microfluidic chips and 0.8mm/1.6mm O.D. tubing,
- Two bundles of tubing,
- A bundle of tubing and a pump, valve or other fluidic system.

Multiflux™ Connectors	Part number
Linear Connector 4-way	3000024
Linear Connector 7-way	3200148
Linear Connector 8-way	3000102
Linear Connector 12-way	3000067
Linear Connector 15-way	3200149
Linear Connector 23-way	3200150
Circular Connector	3000051

Multiflux™ Interfaces	Type	Part number
Chip Interface H	Chip Edge Interface	3000155
Chip Interface C	Chip Edge Interface	3000038
Double Chip Interface H	Chip Edge Interface	3000088
Top Interface 4-way	Chip Surface Interface	3000109
Top Interface 8-way	Chip Surface Interface	3000531
Top Interface 12-way	Chip Surface Interface	3000427
Linear In-line Interface 4-way	In-line Interface	3000395
Linear In-line Interface 8-way	In-line Interface	3000316
Linear In-line Interface 12-way	In-line Interface	3000430
Circular In-line Interface	In-line Interface	3200142
Resealable Chip Interface		3000305

This design guide describes the features that must be included on your system to enable interfacing with a Multiflux™ component. The features include the fluid holes (ports), threads and alignment features.

## 2. Using Multiflux™ with your own microfluidic chip and/or interface

### 2.1 Designing microfluidic chips for edge connection

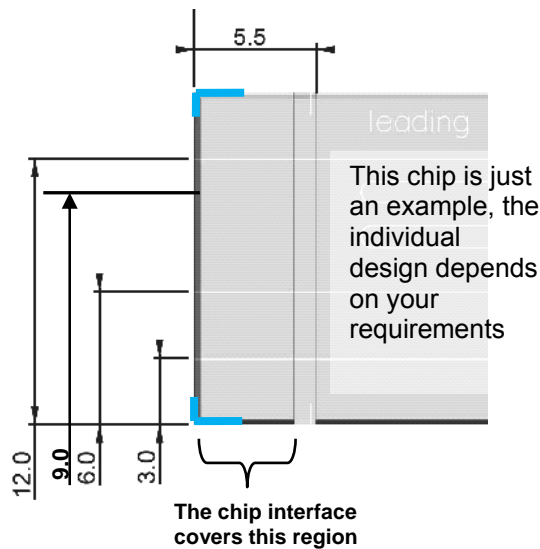
The diagram below shows the features that must be included on your chip to enable interfacing with the Multiflux™ Linear Connector:

You will need the following components to create an edge connection:

Components	Type	Part No.	Chip thickness	Chip width	Chip length
Linear Connector 4-way	Linear Connector	3000024	4mm*	15mm**	> 5mm
Chip Interface H	Chip Edge Interface	3000155	4mm*	15mm**	22.5mm
Chip Interface C	Chip Edge Interface	3000038	4mm*	15mm**	7mm
Double Chip Interface H	Chip Edge Interface	3000088	4mm*	15mm**	22.5mm
Your own interface	Interface	custom			
Your own chip	Microfluidic chip	custom			

\* Tolerances of ± 0.01mm

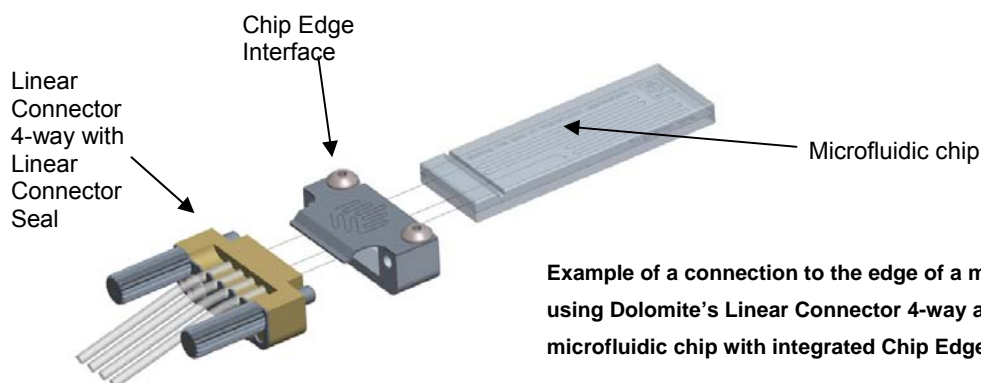
\*\* Tolerances of +0.0mm and -0.05mm



The corner references shown in blue are required for alignment during the wafer dicing process. If you are designing the whole mask it is important to include these lines so that they are etched into the glass wafer. It is important to make sure these lines do not create a leak path on the face of the chip that will mate with the Linear Connector.

Please contact us for more information about the Linear Connector 8-way (Part No. 3000102) and Linear Connector 12-way (Part No. 3000067).

All tolerances in drawing ± 0.05mm



**Example of a connection to the edge of a microfluidic chip using Dolomite's Linear Connector 4-way and Dolomite's microfluidic chip with integrated Chip Edge Interface**

## 2.2 Designing microfluidic chips for surface connection

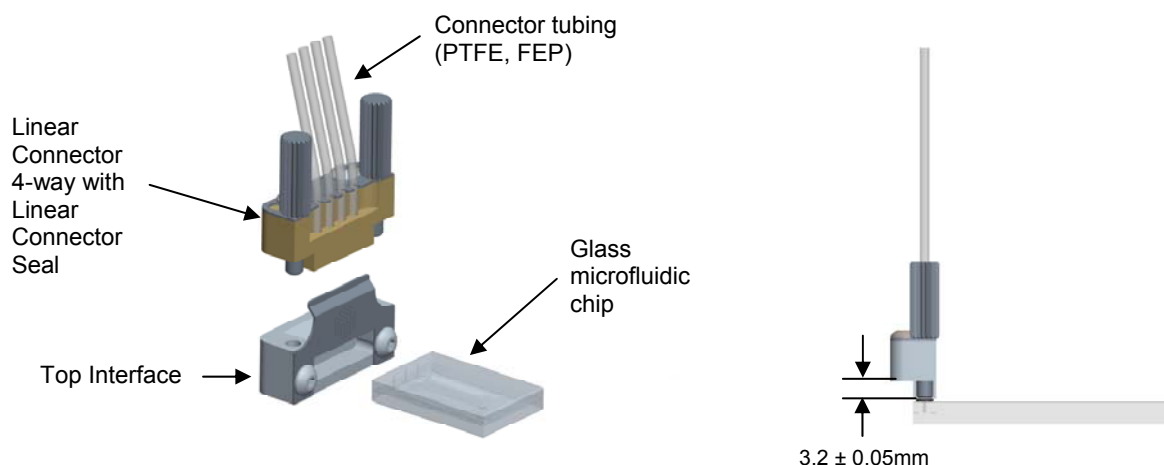
The Linear Connector can also be used to seal onto the top surface of a chip when used in conjunction with a top connector base. As shown in the diagram below, holes for fluid access are required in the top chip layer.

You will need the following components to create a surface connection:

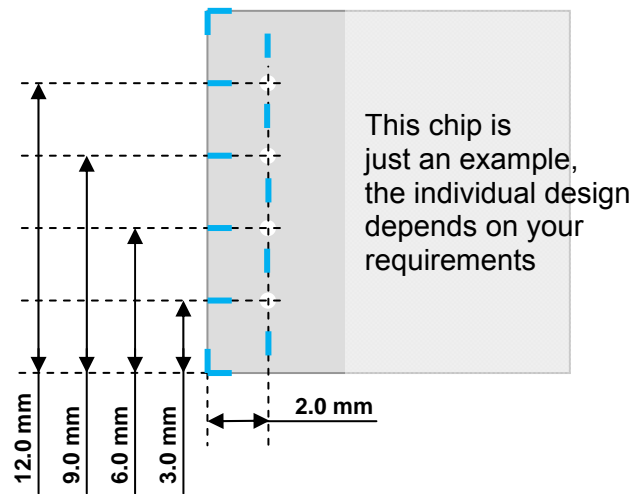
Components	Type	Part No.	Chip thickness	Chip width
Linear Connector 4-way	Linear Connector	3000024	4mm	15mm
Linear Connector 8-way	Linear Connector	3000102	4mm	30mm
Linear Connector 12-way	Linear Connector	3000067	4mm	45mm
Top Interface 4-way	Chip Surface Interface	3000109	4mm*	15mm**
Top Interface 4-way	Chip Surface Interface	3000237	2.15mm*	15mm**
Top Interface 8-way	Chip Surface Interface	3000531	4mm*	30mm**
Top Interface 12-way	Chip Surface Interface	3000427	4mm*	45mm**
Your own interface	Interface		custom	
Your own chip	Microfluidic chip		custom	

\* Tolerances of  $\pm 0.15\text{mm}$

\*\* Tolerances of  $+0.05\text{mm}$  and  $-0.5\text{mm}$



The drilled fluid holes need to be spaced 2mm from the edge of the chip as shown in the layout below:

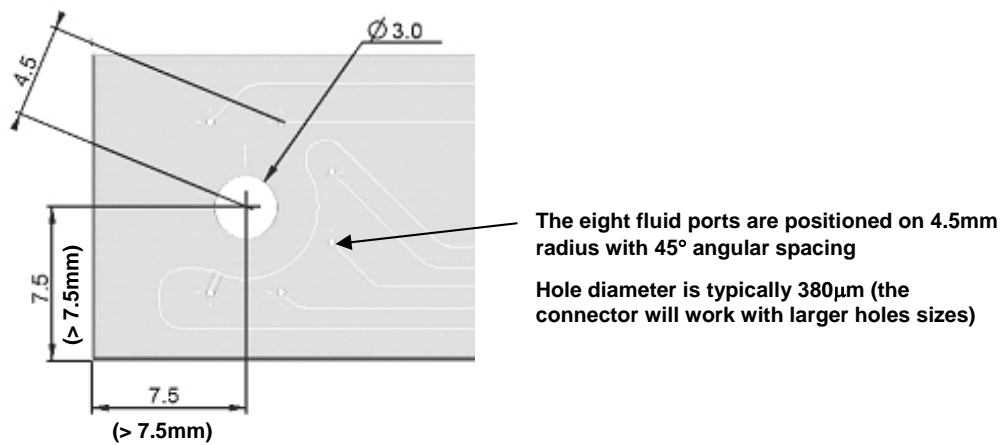


All tolerances in drawing are  $\pm 0.05\text{mm}$ . For large fluid hole sizes this tolerance can be relaxed.

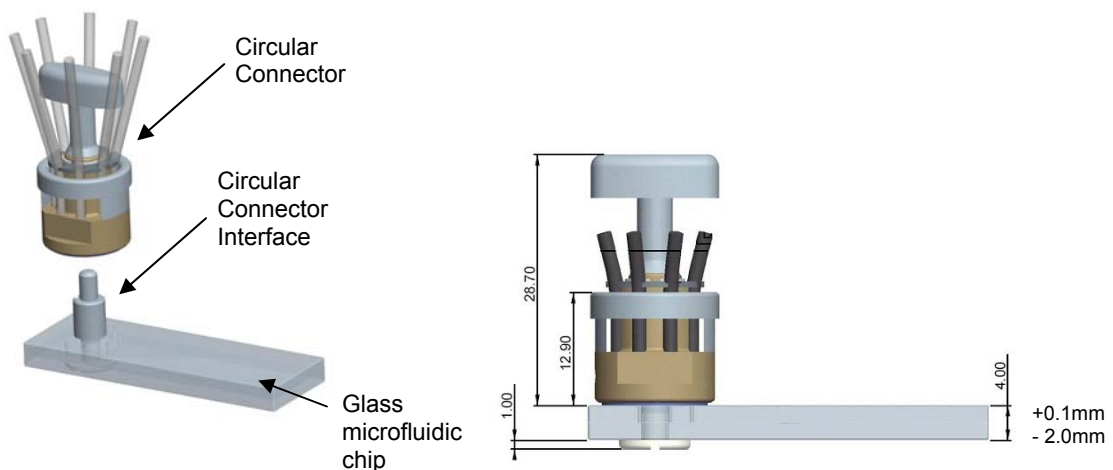
The corner references shown above in blue are required for alignment during the wafer dicing process. If you are designing the whole mask it is important to include these lines so that they are etched into the glass wafer. It may also be necessary to include additional references for hole drilling as shown above.

## 2.2 Designing microfluidic chips for the Circular Connector

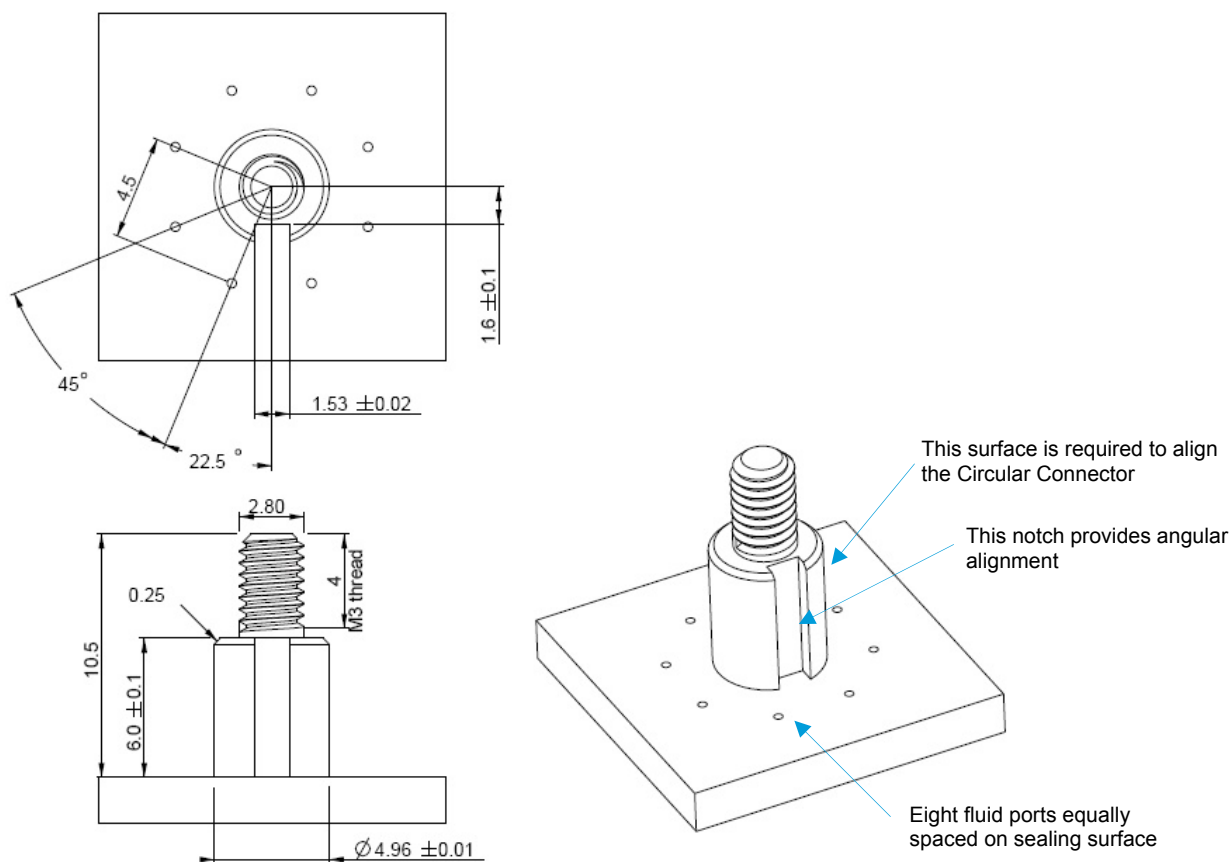
The diagram below shows the features that must be included on your chip to enable interfacing with the Multiflux™ Circular Connector:



All tolerances in drawing are  $\pm 0.01\text{mm}$ . For large fluid hole sizes this tolerance can be relaxed.



The Circular Connector and Circular Connector Interface will work with chips that are 2-4mm in thickness. Thinner chips can be used with a spacer that is greater than 12mm in diameter.



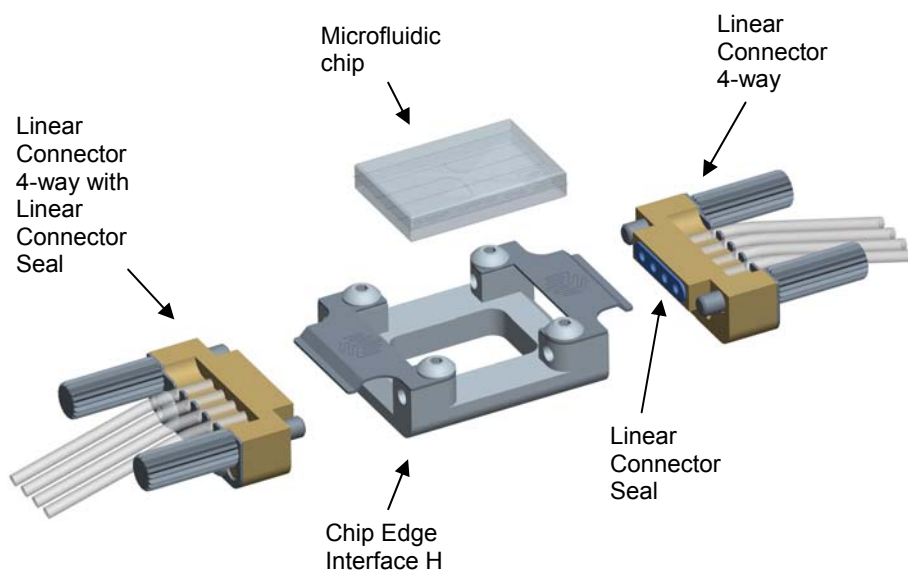
Where dimension tolerance is not shown then use  $\pm 0.1$ mm.

You will need the following components to use the Circular Connector:

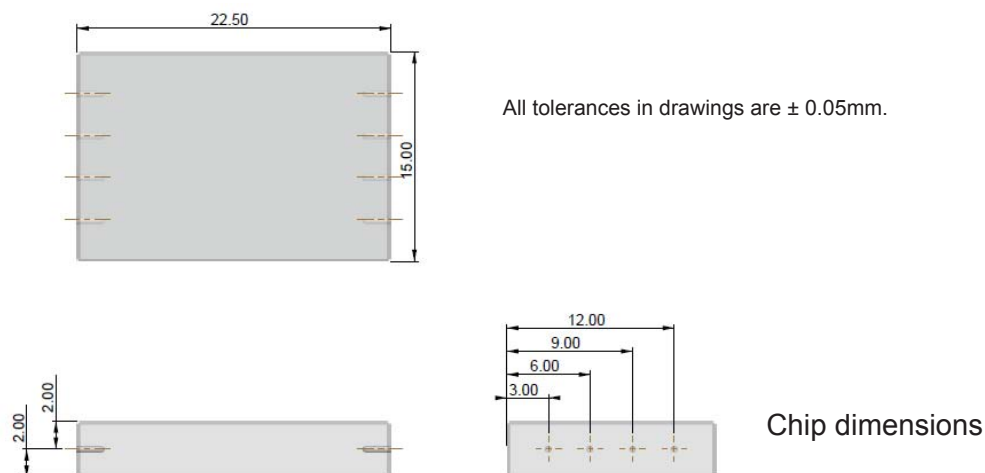
Components	Type	Part No.	Chip thickness	Chip width
Circular Connector	Circular Connector	3000051	2 - 4mm	$\geq 15$ mm
Circular Connector Interface	Circular Interface	3000102	2 – 4mm	$\geq 15$ mm
Your own interface	Interface		custom	
Your own chip	Microfluidic chip		custom	

### 3. Using Multiflux™ with Dolomite's Multiflux™ Compatible Interfaces

Successful connections between microfluidic chips and tubing or two bundles of tubing require both a Multiflux™ Connector and Multiflux™ Compatible Interface. Dolomite provides a wide range of Multiflux™ Compatible Interfaces including Chip Edge Interfaces (see example below), Chip Surface Interfaces and In-line Interfaces.



**Example of a connection to the edge of a microfluidic chip using the Chip Interface H (Part No. 3000155): the Chip Interface H works in conjunction with two Linear Connectors 4-way (Part No. 3000024) providing eight fluidic connections to a microfluidic chip.**



Please contact us for details on the other Chip Edge, Chip Surface and In-line Interfaces.

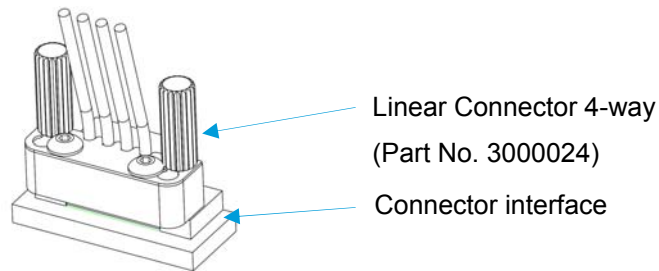
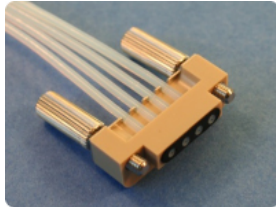
## 4. Using Multiflux™ to connect modules in your fluidic system

The following diagrams show suggested interfaces for the Linear Connector 4-way and 8-way as well as the Circular Connector.

The thumb screws on the connectors engage with the threads shown in the connector interfaces. Tightening down the thumb screws will provide a compression force on the seal in the connector. Compressing the seal, results in sealing between the tubes in the connector and the surface of the interface. The thumb screws are sized so that hand tightening results in the connector sealing to the pressure specified in the datasheet. This assumes that the sealing surface is flat and clean.

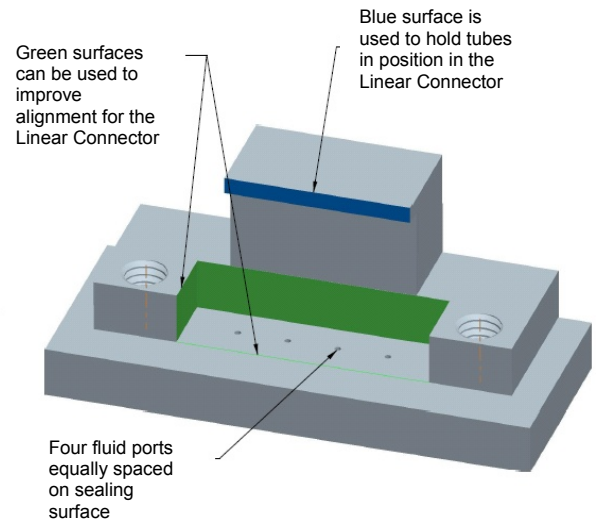
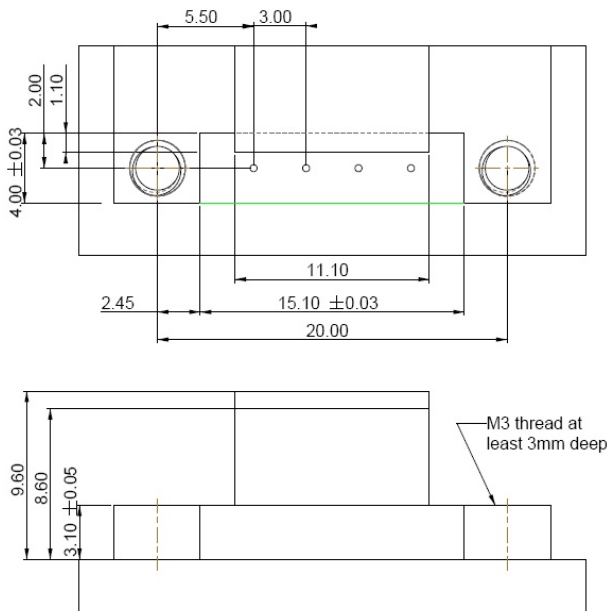
The thumb screw threads also provide rough alignment between the Multiflux™ devices and the fluid holes on the interface. To improve the accuracy of alignment we suggest that the connector is also aligned to some surfaces on the interface. These surfaces are indicated in the diagrams below. It will be necessary to use these surfaces when aligning tubes with small internal diameters (<0.5mm).

### 4.1 Multiflux™ Linear Connector 4-way



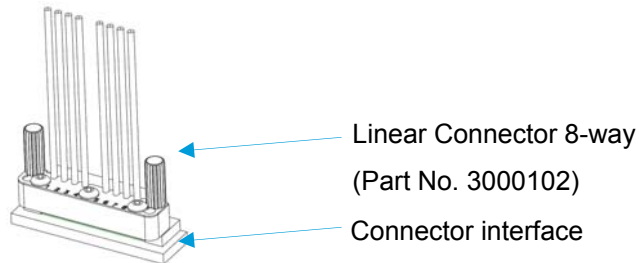
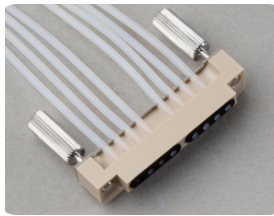
#### Geometry for the Linear Connector 4-way

For the Linear Connector an additional surface is indicated in blue (see below). This surface is required to hold the fluid tubes in the connector. If this surface is not included then there is a risk that the fluid tubes could be pulled out of the connector. This surface is not required when using the Circular Connector.



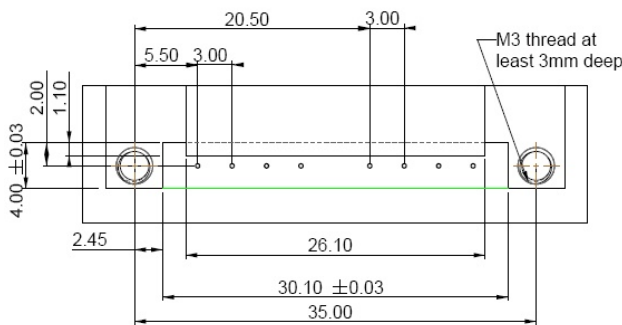
Where dimension tolerance is not shown then use ± 0.1mm.

## 4.2 Multiflux™ Linear Connector 8-way



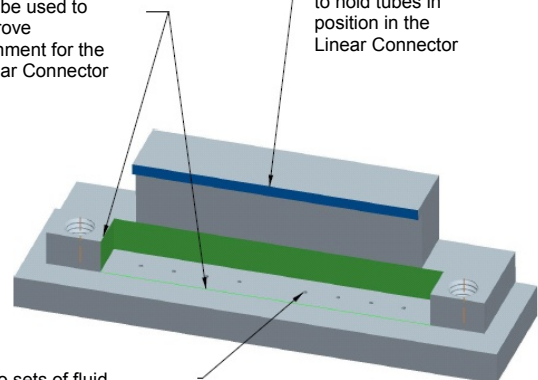
### Geometry for the Linear Connector 8-way

For the Linear Connector an additional surface is indicated in blue (see below). This surface is required to hold the fluid tubes in the connector. If this surface is not included then there is a risk that the fluid tubes could be pulled out of the connector. This surface is not required when using the Circular Connector.



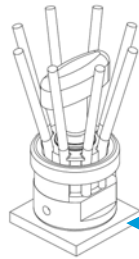
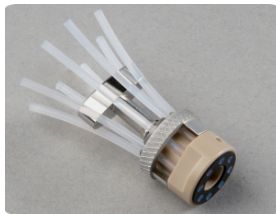
Green surfaces can be used to improve alignment for the Linear Connector

Blue surface is used to hold tubes in position in the Linear Connector



Where dimension tolerance is not shown then use ± 0.1mm.

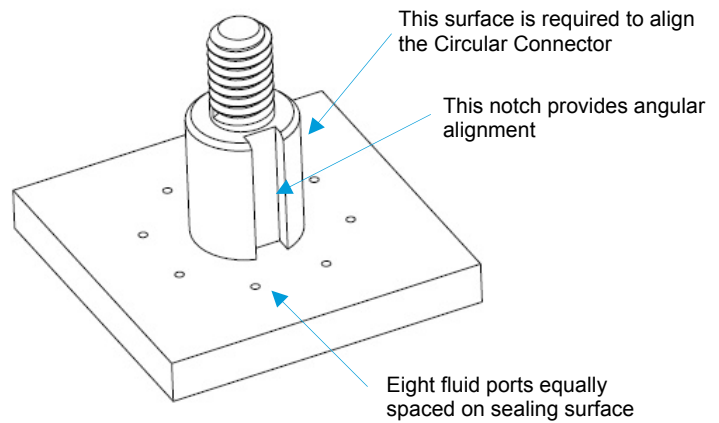
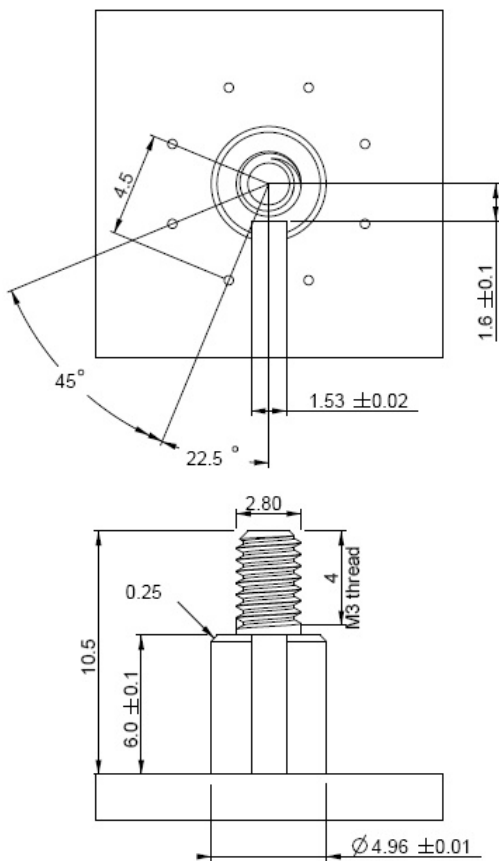
### 4.3 Multiflux™ Circular Connector



Circular Connector (Part No. 3000051)

Connector Interface

### Geometry for the Circular Connector



Where dimension tolerance is not shown then use  $\pm 0.1$ mm.



## 5. Tube-to-tube connections

Dolomite’s In-line Interfaces provide a single, fast and reliable multi-way connection which offers extensive time savings when compared to traditional connections between individual tubing.

You will need the following components to create a tube-to-tube connection:

Components	Type	Part No.
Linear Connector 4-way	Linear Connector	3000024
Linear Connector 8-way	Linear Connector	3000102
Linear Connector 12-way	Linear Connector	3000067
Linear In-line Interface 4-way	In-line Interface	3000395
Linear In-line Interface 8-way	In-line Interface	3000316
Linear In-line Interface 12-way	In-line Interface	3000430

	<p>The Linear In-line Interfaces work in conjunction with two Linear Connectors providing inline sealing and highly accurate alignment between two sets of tubing, enabling uninterrupted liquid flow.</p>
	<p>Designed for use with two Circular Connectors the Circular In-line Interface provides inline sealing and highly accurate alignment of up to eight high pressure fluid channels.</p>

For more information, please visit our website or contact us.

## 6. Custom option



Dolomite offers a wide range of custom solutions including:

- bespoke connector solutions with operating temperatures up to 1000°C and operating pressure up to 1000bar, and
- microfluidic chips with different junction geometries, channel sizes and surface properties.

Please contact us to discuss your exact requirements.

## 7. Trademark

Dolomite is regarded by many as a “centre of excellence” for the design, prototyping and manufacture of microfluidic solutions. Since 2005 we have launched over 150 leading edge products pioneering new technologies as well as the use of microfluidic devices for small scale fluid control and analysis.

We are proud of our achievements and very passionate about protecting our brands. You do not need our permission to use our Multiflux™ Connectors or Multiflux™ Compatible Interfaces. However, if you are designing and/or manufacturing your own Multiflux™ compatible device, please make sure that it is defined as “**Multiflux™ compatible**” using the correct trademark as shown below:

**Multiflux™**

Please contact us for more information.



**The Dolomite Centre Ltd.**

Unit 1, Anglian Business Park, Royston,  
Hertfordshire, SG8 5TW, United Kingdom

**T:** +44 (0)1763 242491

**F:** +44 (0)1763 246125

**E:** [info@dolomite-microfluidics.com](mailto:info@dolomite-microfluidics.com)

**W:** [www.dolomite-microfluidics.com](http://www.dolomite-microfluidics.com)

**Dolomite Microfluidics**

29 Albion Place  
Charlestown, MA 02129

**F:** 617 848 1211

**F:** 617 500 0136

**E:** [salesus@dolomite-microfluidics.com](mailto:salesus@dolomite-microfluidics.com)

**W:** [www.dolomite-microfluidics.com](http://www.dolomite-microfluidics.com)