**Rectangular Channel (straight)**

***Basic Component description***

Straight channel with rectangular cross section

***Component Specs***

Basic transport of fluids between components

***List Input and Output nodes***

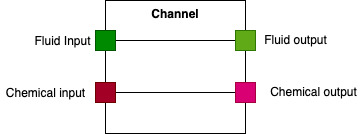


Figure 1: Channel diagram

One fluid input, one fluid output, input = output

One chem input, one chem output, input = output

in({P} [type] fluid input, {V} [type] chemical input)

out({P} [type] fluid output, {V} [type] chemical output)

This section will describe the individual connecting nodes of the component. The descriptions show be brief and should not contain any equations but describe the how the “signal” is changed from input to output. As well as any other information about the interaction of the nodes. We will need to describe whether the nodes are physical channels or are virtual nodes that contain information on the fluid, such as viscosity, chemical concentrations. This will need to additionally contain what type of information will be carried by the node (It would be bad to connect a node that contains chemical concentration to a fluid flow node). This will be paired with a diagram like above to visualize how the nodes are connected.

***Microfluidic Operations***

Transport

***Component Geometric parameters***

(l | length, w | width, h | height)

h < w

***Virtuoso Description***

**OpenSCAD Description**

This is the channel function for routing in openSCAD

routing(p0, pf, dimm);

**p0** - is starting point of rounting channel as an array of form [x, y, z]

**pf** - is a list of channel dimensions of vector form [offset, length, channel direction].

* Offset is a string “[+/-]XXXX” where the first character is whether the directions are positive or negative, the following characters are the offset direction for the string index -1. This is the offset direction of the for the router.
* Length is the channel length for that segment
* Channel direction is a number 1-6 that describes the channel extrude direction

**dimm** - is an array with the length 6, this describes the the channel dimension for a given direction

***Manufacturing Description***

This section will contain information of the process that is need to create the component. This will include information on the exposure profile, and how this changes throughout the part, and special post processing steps that need to be done.

***Component model***

This will be the complete mathematical description of the geometric parameters with the flow properties

Q = (1-0.630\*h/w)\*(h^3\*w)/(12\*eta\*l)\*delta\_p

R\_hyd = (12\*eta\*l)/((1-0.63\*(h/w))\*h^3\*w)

Q = flow rate

R\_hyd = hydraulic resistance

Eta = dynamic viscosity

Delta\_p = change in pressure

***References***

[1] H. Bruus. “Chapter 1: Governing Equations in Microfluidics.” *Microscale Acoustofluidics*, 2014, pp. 1-28. <https://pubs.rsc.org/en/content/chapterhtm/2014/bk9781849736718-00001?isbn=978-1-84973-671-8>