

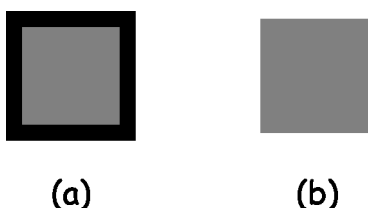
## Mask design rules

### 1. Choose your program

The program you use should be able to save the drawing as an encapsulated postscript file (EPS). Almost all drawing programs can do this, the most common being Adobe Illustrator and Corel Draw. Therefore, the rest of the design rules assume you will be using one of these programs. If you use another drawing program, be prepared to spend time on the phone with the print shop!

### 2. Recommended settings

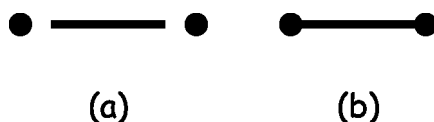
- Set the page size to 8.5" x 11".
- Only use black and white.
- Draw everything to scale. Millimeters are a useful unit to use since they can easily be converted to micrometers without a calculator.
- Set the stroke (border) width to 0. As shown in Figure 1, a border width > 0 results in a slightly larger shape than what you intended.



**Figure 1.** (a) A 15 mm square with a 6 pt border. (b) A 15 mm square with a 0 pt border.

### 3. Drawing microchannels

Channel designs are created by overlapping simple geometric shapes, such as rectangles and circles. For example, two circles and a rectangle (Fig. 2a) can be used to make a simple microchannel (Fig. 2b).



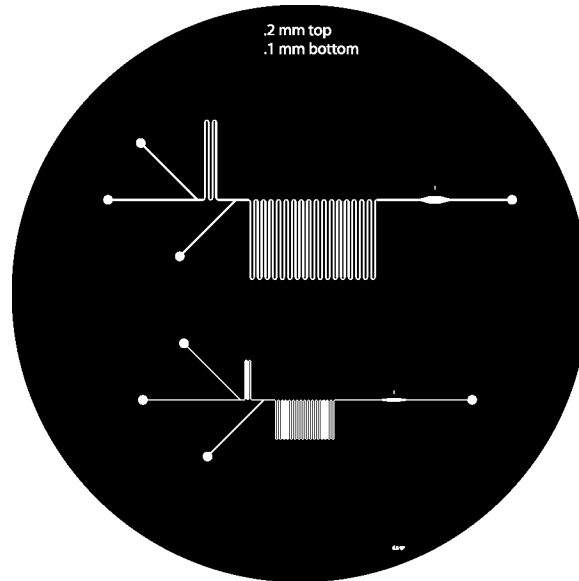
**Figure 2.** (a) Two circles 3 mm in diameter and a rectangle 10 mm long and 1 mm wide. (b) Slightly overlapping each end of the rectangle with the circles creates a microchannel with two ports.

Because SU-8 is a negative tone photoresist<sup>1</sup>, you will want to block most of the UV light with your mask. Before drawing your microchannels, you should draw a black circle the size of your silicon (Si) wafer master. The most common Si wafer size is 3". Then, you should draw all your microchannels within the black circle (Fig. 3). The circle is helpful for two other reasons:

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<sup>1</sup> Negative tone photoresist: Whatever UV light hits hardens and does not wash off in developer; positive tone photoresist is the opposite.

first, it provides a boundary that lets you know how much wafer real estate you have to work with; second, it facilitates cutting out each mask when you get your film back.



**Figure 3.** Draw your microchannel designs inside of a black circle. The circle should be the same diameter as the Si wafer you will use for your master.

Write important information about your design into the mask. For example, you might want to include channel dimensions or other notes so that you don't have to go back to your drawing file to find channel dimensions.

You should be able to get nine circles in a 8.5" x 11" film if you arrange them like chevrons. If you need more space, call the print shop (see below) and ask if they can accommodate larger dimensions.

Once you are done drawing your mask(s), save your drawing as an encapsulated postscript file (EPS). Be sure "Include Document Fonts" is unchecked.