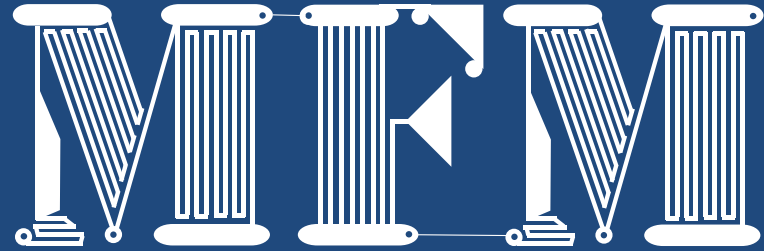


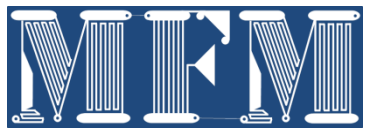
# Design Kits For Micro Fluidics

Marcel van der Vliet  
PhoeniX Software



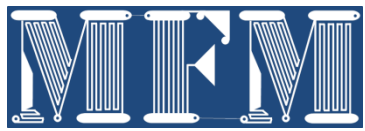
# CONTENT

- OptoDesigner Software
- Micro Fluidic Design Guidelines
- Process Design Kit
- DPL / Market place interface
- Assembly Design Kit



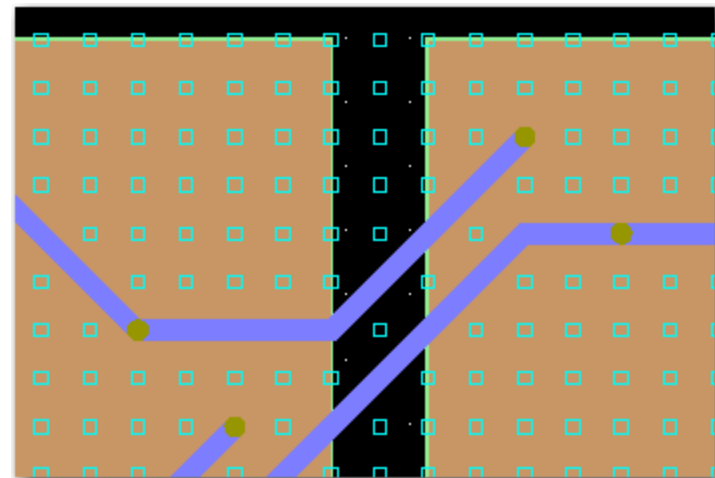
# OptoDesigner Software

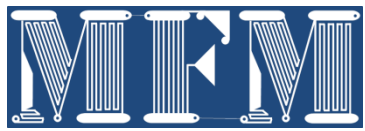
- Design of Fluidic Boards (Building Blocks)
  - Using Process Design Kits
- Design of Assemblies
  - Using Assembly Design Kits
- Simulations
  - Fluidic simulations using spice models
- Interact with the Market Place / DPL



# Design Guidelines

- Use of compliant Fluidic Board templates
  - Fixed board sizes
  - Standard grid for placement of connectors
    - A1, A2, etc.
    - Grid spacing,
    - Space to edge
  - Side connector positions
  - Suggested locations for Electrical connections





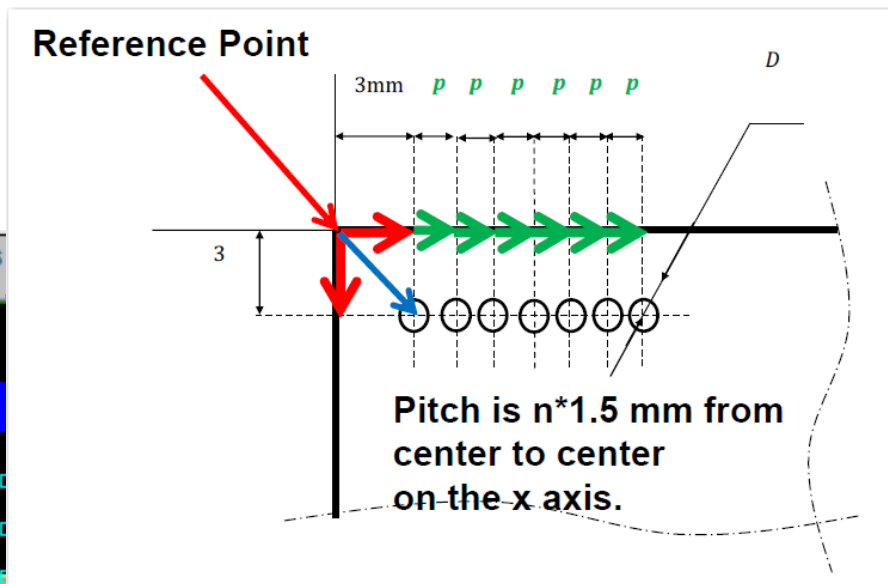
# Checks on Design and process

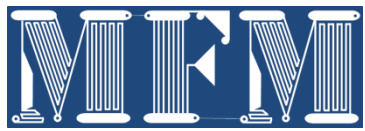
- Design Rules for the FCB
  - Showing exclusion zones for connectors
  - Showing clamping areas
  - Minimum Channel Spacing checks on FCB
  - Custom rules can be added
- Assembly checks
  - Checks for maximum assembly temperature
  - Checks for maximum assembly pressure



# MFM Standard

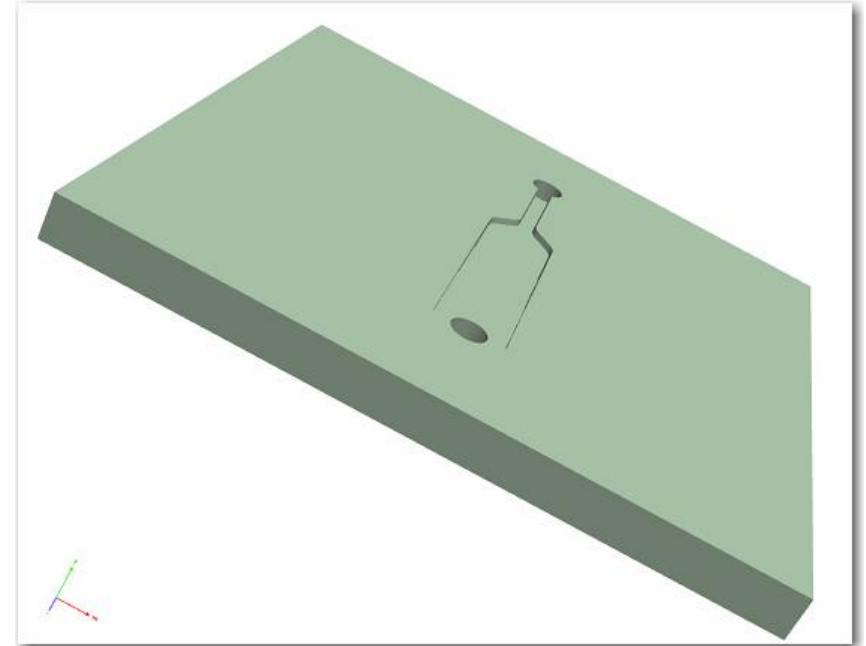
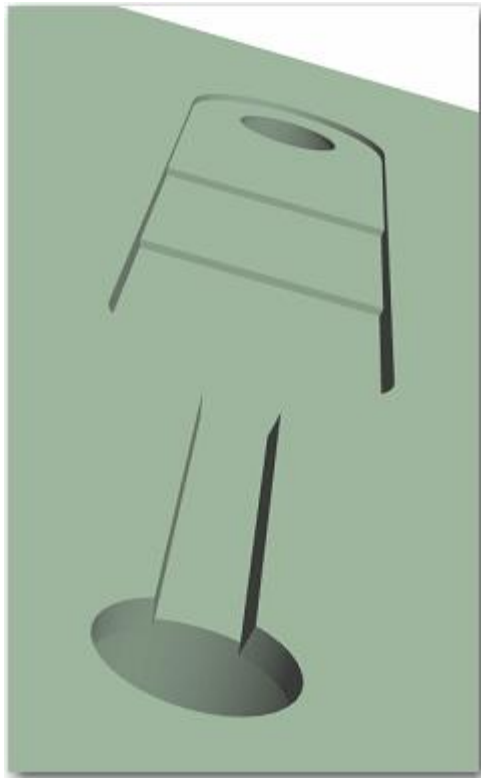
```
39 // -----  
40 // pxMF_Valve(location : radius, via)  
41 mfm01 (15000,15000,"mcsBB_OUTLINE") BB1;  
42 BB1.setName("VALVE1");  
43 var bb1 = BB1.place( bil -> block @ C2 + [0,0,0] : &ApixFCB, &pGlue);  
44 var VALVE1 = ml::pxMF_Valve( bor -> block @ C2 + [0,0,180] : 2000, 600);  
45
```

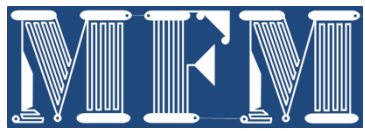




# Process Design Kit

- Hemoglobin Device



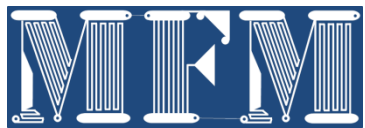


# Process Parameters

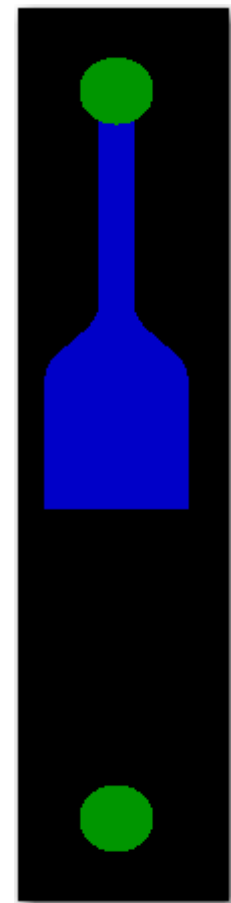
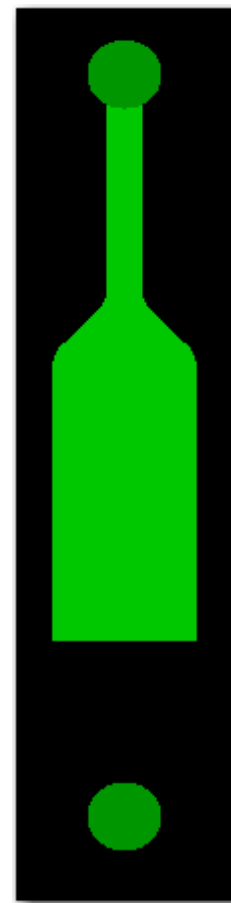
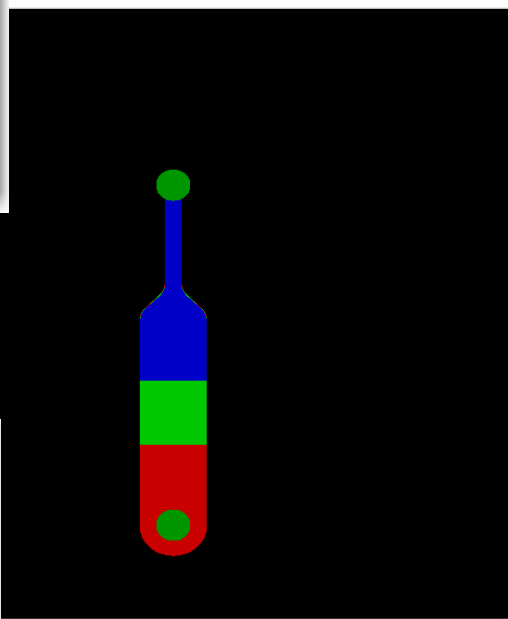
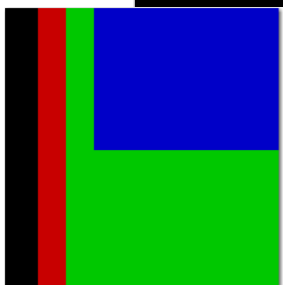
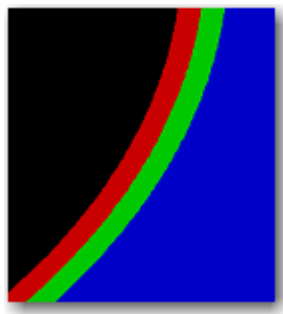
- Side wall angle (X degrees)
- New mask needed for each step of Y um
- Z% shrinkage
- 5X scaling for projection

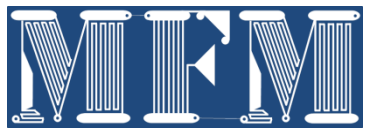




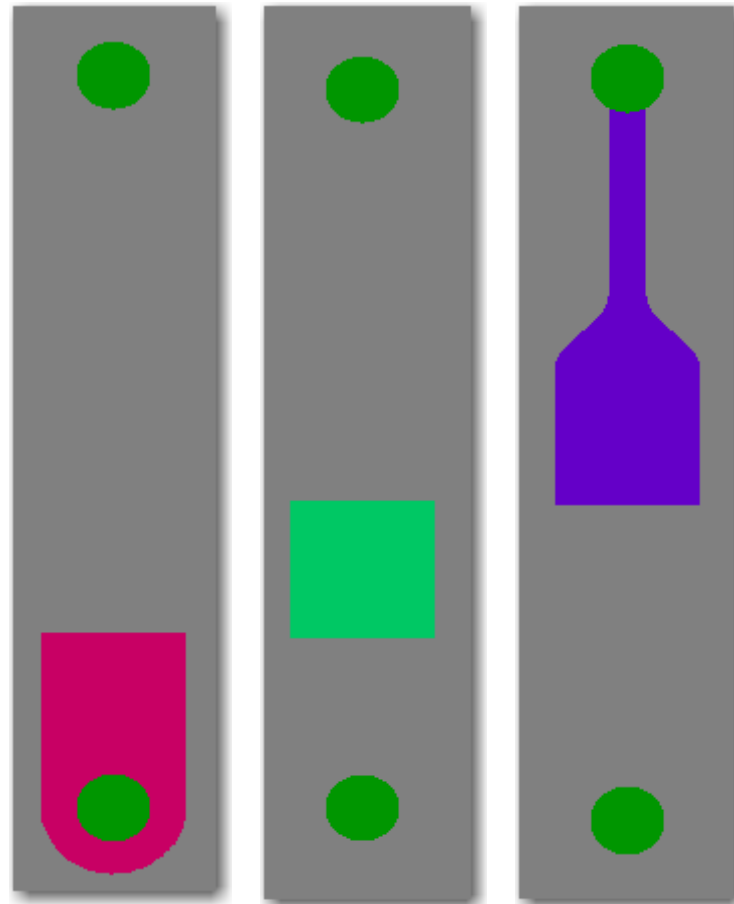
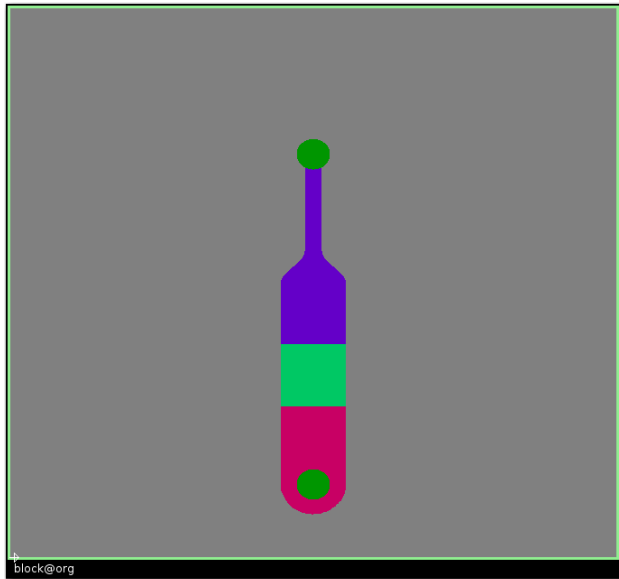


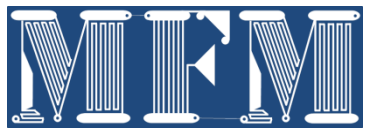
# GDS II Mask Data





# Design Intent





# Design using Building Blocks

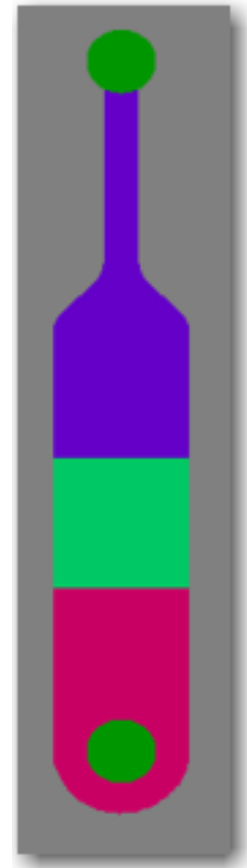
- To make the design 3 BB are needed
  - Circle
  - Straight
  - Taper

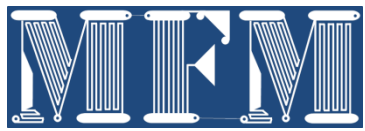
```
mask::CSselect("mcsDepth1");
ml::Philips_Circle(C->block@org + [blockL*0.5,           ) circl_1;
ml::Philips_StraightChannel(in0->circl_1@C+[0,0,           ) str_1;

mask::CSselect("mcsDepth2");
ml::Philips_StraightChannel(in0->str_1@out0:           ) str_2;

mask::CSselect("mcsDepth3");
ml::Philips_StraightChannel(in0->str_2@out0:           ) str_3;
ml::Philips_Taper(out0->str_3@out0+[0,0,180]:         ) taper_3;
ml::Philips_StraightChannel(out0->taper_3@in0:        ) str1_3;

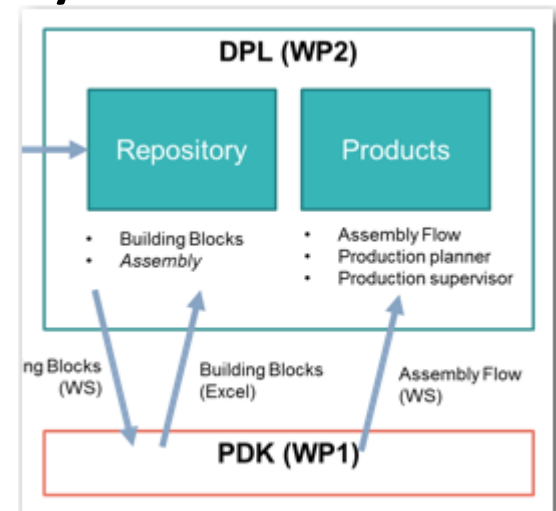
mask::CSselect("mcsHOLE");
ml::Philips_Hole(C->block@org + [blockL*0.5,           ) ;
ml::Philips_Hole(C->circl_1@C+           ) ;
```

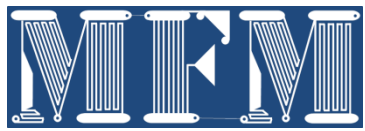




# Market Place - OptoDesigner

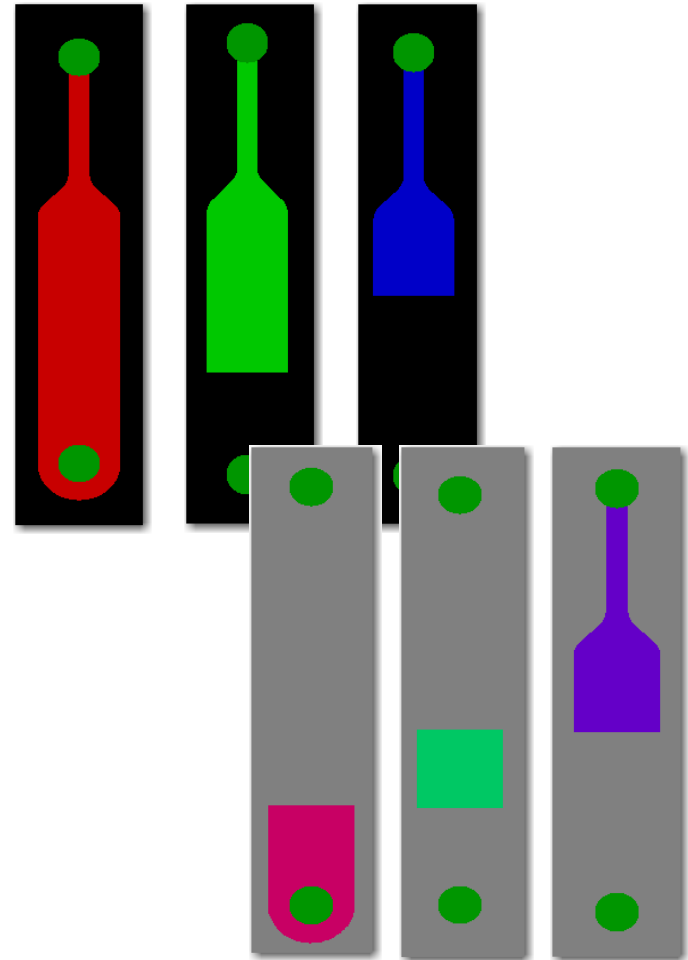
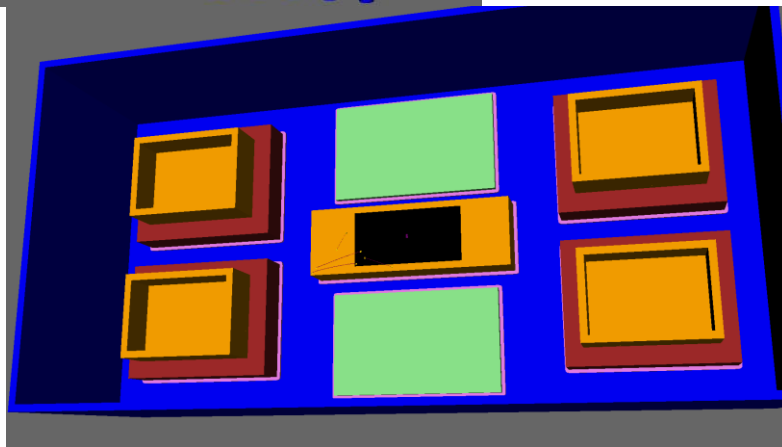
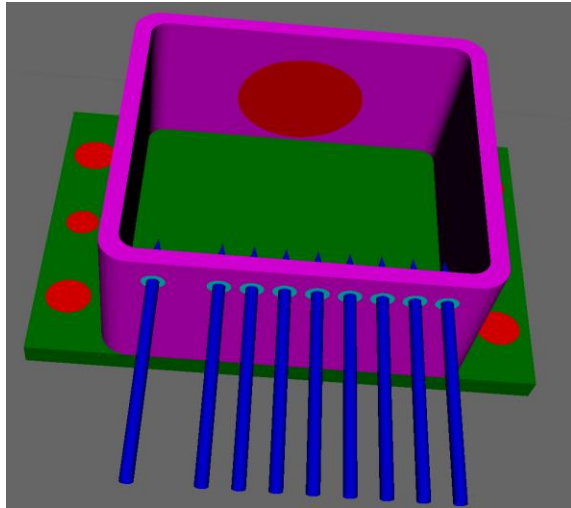
- Load Fluidic Board Templates from market place
- Use Process Design Kit to design your FCB
- Add your own FCB to the market place
- Load additional parts from market place
- Create your assembly and assembly flow
- Check your design
- Upload your design to the market place

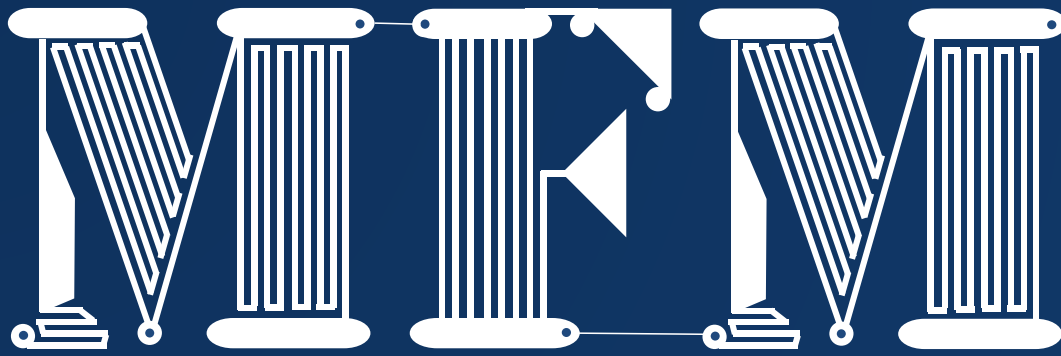




# Assembly Design Kit

- ADK vs PDK





Thank You for your attention

