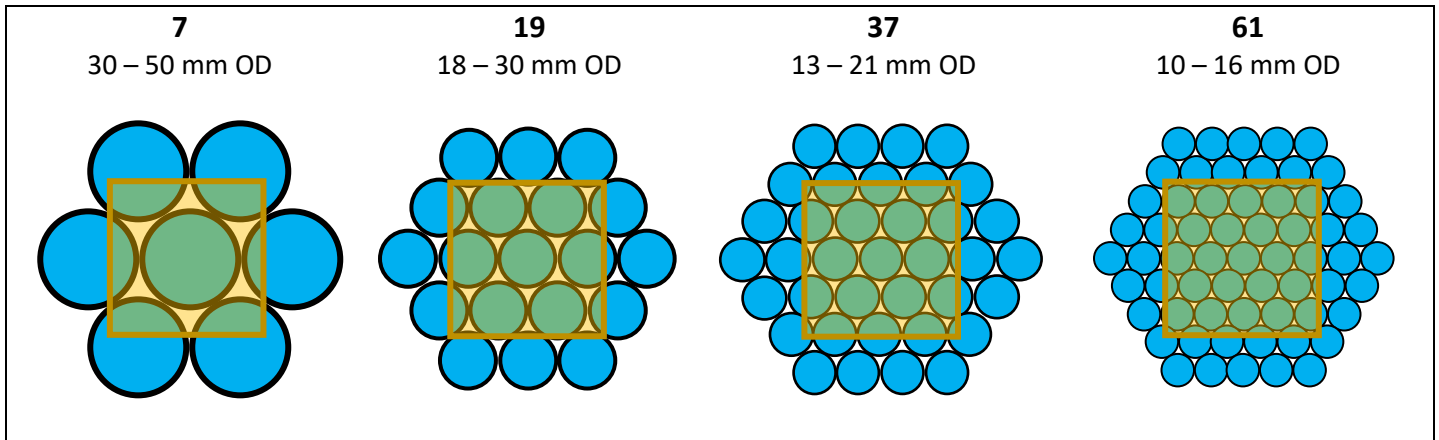


## MicroFD LyoSim Vial Array Sizing Guide

The vials in a MicroFD are arranged in a hexagonal pattern. The number of vials in the array is determined by the size of the vials, ranging from seven to sixty-one, as shown below in Figure 1.



**Figure 1 – The possible vial configurations within the LyoSim ring in the MicroFD. The orange square represents the heat flux sensor, which must be completely covered with the array of vials.**

The size of the array, or the number of vials in the configuration, is limited by the size of the LyoSim ring and the coverage of the heat flux sensor. All of the vials must fit within the LyoSim ring, which presents a maximum limitation on the size of the array. Additionally, to ensure accurate data from the heat flux sensor it is critical that the entire surface of the sensor is covered with vials, and not covered by the LyoSim Emulator Blocks.


The maximum and minimum vial diameters for each given configuration are shown in Table 1. The minimum OD is not dependent on a physical constraint, but rather by the need to cover the heat flux sensor.

Possible Vial Sizes		
# of Vials	Min OD (mm)	Max OD (mm)
7	30.0	50.7
19	18.4	30.4
37	13.2	21.7
61	10.3	16.9

**Table 1 – Minimum and Maximum vial sizes for a given configuration**

For a given vial OD, Table 2 shows the possible vial configuration that can be used in the MicroFD.

Vials OD(mm)	7	19	37	61
11 - 13				
14 - 16				
17 - 18				
19 - 21				
22 - 29				
30				
31 - 50				

 = Ideal Vial Configuration

**Table 2 – Possible configurations for a given Vial OD**

Currently, Millrock Technology has designed Emulator Blocks to fit twenty-one different vial arrays for a range of vial sizes and configurations, from standard ISO vial sizes to customer specific custom vial sizes. Table 3 shows a list of many of the currently available vial arrays for a variety of ISO standard and unique vial sizes. ***Custom Emulator Blocks can be fabricated to fit your specific needs and unique vial sizes.***

Vial Type	Vial OD (mm)	# of Vials
11090356	11.6	61
2R	16	37
4R	16	37
ABB 3ml	16.75	37
-	20.5	19
6R	22	19
8R	22	19
10ml	23.75	19
10R	24	19
15ml	25.25	19
-	26.25	19
20R	30	7
20R	30	19
EBB 20ml	30.2	7
ABB 30ml	34.75	7
-	35.75	7

**Table 3 – Currently available vial configurations**