

Jellyfish™ Filter System Sizing Guidelines

The Jellyfish filter system is typically used in situations where a specified flow rate must be treated (i.e. the “water quality flow rate” or “treatment flow rate”). The treatment flow rate should be determined by the engineer in accordance with methods approved by the local jurisdiction. With this information, it is then a simple process to select the right number of Jellyfish cartridges and vessel configuration using the Jellyfish Filter System Sizing Table – Flow Rate (see Table 1 below).

A second consideration is the anticipated sediment load that will enter the Jellyfish filter system. The sediment load influences the Jellyfish cartridge service life and required maintenance interval. Through a combination of settling and filtration processes, the Jellyfish filter system is typically designed to treat 50 pounds of sediment per cartridge before requiring maintenance, based on sediment that is approximately 55% sand, 40% silt, and 5% clay. Sediment mass removal per cartridge will vary depending on cartridge diameter, tentacle length, sediment characteristics, and rainfall intensity. The anticipated sediment load and sediment characteristics should be determined by the engineer. The proper number of Jellyfish cartridges required to meet sediment removal requirements is easily determined by referring to the Jellyfish Filter System Sizing Table – Sediment Mass Removal (see Table 2 below).

A third consideration involves situations in which the Jellyfish filter system is employed downstream of a detention facility. In these cases the Jellyfish system will typically receive a relatively low flow rate (controlled release rate) from the detention facility compared to flow rates that would be experienced if the Jellyfish system treated the site runoff directly. In such cases, the size of the Jellyfish vessel will typically be reduced and the total sediment mass removal per cartridge will be increased. System sizing should be based on the flow rate and annual sediment load going to the Jellyfish system, accounting for sediment that is expected to settle out in the detention facility.

It is important for the engineer to confirm that the system design has adequate storage capacity for anticipated pollutant loads that will accumulate over the specified maintenance interval. The oil and sediment pollutant capacities for each Jellyfish vessel configuration are referenced in Table 3 (see below).

The U.S. EPA has determined typical annual pollutant loads per acre for various sites by land use. This data is referenced in Table 4 (see below).

Table 1
Jellyfish Filter System Sizing Table - Flow Rate

Vessel Configuration	Diameter of Cartridges (inches)	Max. No. of Standard Cartridges	Flow Rate* of Standard Cartridge (gpm)	No. of Draindown Cartridges	Flow Rate* of Draindown Cartridge (gpm)	Max. System WQ Treatment Flow Rate (gpm/cfs)
4 ft dia. Manhole	12	2	50	1	25	125 / 0.28
6 ft dia. Manhole	12	6	50	1	25	325 / 0.72
8 ft dia. Manhole	12	10	50	2	25	550 / 1.23
10 ft dia. Manhole	12	16	50	3	25	875 / 1.95
12 ft dia. Manhole	12	24	50	4	25	1300 / 2.90
Rectangular Vaults	12	variable	16 to 50	variable	8 to 25	variable

* 54-inch tentacles, 12 inches of driving head, 2 feet of sump

Table 2
Jellyfish Filter System Sizing Table
Sediment Mass Removal

Cartridge Diameter (inches)	Tentacle Length (inches)	Sediment Mass Removal (pounds)
12	18	17
12	36	33
12	54	50

Table 3
Jellyfish Filter System – Wet Volume & Pollutant Capacities*

Vessel Configuration	Wet Volume Available Below Insert Deck (gallons)	Sediment Capacity at 12 inch Depth (ft ³)	Oil Capacity at 2 ft. of Outer Channel Depth (gallons)
4 ft dia. Manhole	611	12	100
6 ft dia. Manhole	1375	28	224
8 ft dia. Manhole	2444	50	388
10 ft dia. Manhole	3819	78	608
12 ft dia. Manhole	5500	113	732
Rectangular Vaults	variable	Variable	variable

*Assumes 6.5 feet from bottom of insert to vessel floor. Systems with greater depth will have increased wet volume and sediment capacity.

Table 4
Typical Urban Areas and Pollutant Yields (Sediment)
(Burton and Pitt, 2002)

Pollutant	Pollutant Load by Land Use (lbs/acre/year)							
	Commercial	Parking Lot	Residential Density			Highways	Industrial	Shopping Centers
			High	Med.	Low			
TSS	1000	400	400	250	10	880	500	440

Source: U.S. EPA Stormwater Best Management Practice Design Guide

For more information, please contact an Imbrium Systems representative at:
 1(888) 279 8826 (USA) | 1 (800) 565 4801 (Canada) | +1 416 960 9900 (International)