



# Filter Sizing Information

## FO Series Filter Cartridges

### CARTRIDGE FLOW RATE (USGPM) VS. VISCOSITY DATA FOR 2 PSI AND 5 PSI INITIAL PRESSURE DROPS

CARTRIDGE	33 SUS 2 CS		39 SUS 4 CS		46 SUS 6 CS		59 SUS 10 CS		98 SUS 20 CS		142 SUS 30 CS		187 SUS 40 CS	
	2 PSI	5 PSI	2 PSI	5 PSI	2 PSI	5 PSI	2 PSI	5 PSI	2 PSI	5 PSI	2 PSI	5 PSI	2 PSI	5 PSI
FO-614PLF1/2	68	68	50	66	33	65	20	50	10	25	7	17	5	12
FO-614PLF1	68	68	50	66	33	65	20	50	10	25	7	17	5	12
FO-614PLF2	68	68	66	66	65	65	52	64	26	63	18	44	13	33
FO-614PLF5	68	68	66	66	65	65	64	64	63	63	53	62	40	61
FO-614PLF25	68	68	66	66	65	65	64	64	63	63	62	62	61	61
FO-614PLF75	68	68	66	66	65	65	64	64	63	63	62	62	61	61
FO-718PL1/2	50	50	50	50	38	50	23	50	12	29	8	19	6	15
FO-718PL01	50	50	50	50	38	50	23	50	12	29	8	19	6	15
FO-718PL02	50	50	50	50	50	50	50	50	31	50	21	50	16	39
FO-718PL05	50	50	50	50	50	50	50	50	50	50	50	50	50	50
FO-718PL15	50	50	50	50	50	50	50	50	50	50	50	50	50	50
FO-718PL50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
FO-618FGA5	68	68	66	66	42	65	25	60	13	31	8	21	6	16
FO-618FGA10	68	68	66	66	50	65	30	64	15	38	10	25	8	19
FO-618FGA25	68	68	66	66	50	65	30	64	15	38	10	25	8	19

CARTRIDGE	233 SUS 50 CS		348 SUS 75 CS		463 SUS 100 CS		927 SUS 200 CS		1390 SUS 300 CS		1853 SUS 400 CS		2316 SUS 500 CS	
	2 PSI	5 PSI	2 PSI	5 PSI	2 PSI	5 PSI	2 PSI	5 PSI	2 PSI	5 PSI	2 PSI	5 PSI	2 PSI	5 PSI
FO-614PLF1/2	4	10	3	7	2	5	1	3	1	2	-	1	-	1
FO-614PLF1	4	10	3	7	2	5	1	3	1	2	-	1	-	1
FO-614PLF2	10	26	7	18	5	13	3	7	2	4	1	3	1	3
FO-614PLF5	32	60	22	55	16	40	8	20	5	13	4	10	3	8
FO-614PLF25	60	60	59	59	45	58	22	55	15	50	11	28	9	23
FO-614PLF75	60	60	59	59	58	58	45	57	30	56	22	55	18	45
FO-718PL1/2	5	12	3	8	2	6	1	3	1	2	1	2	-	1
FO-718PL01	5	12	3	8	2	6	1	3	1	2	1	2	-	1
FO-718PL02	12	31	8	21	6	16	3	8	2	5	2	4	1	3
FO-718PL05	41	50	27	50	20	50	10	25	7	17	5	13	4	10
FO-718PL15	50	50	50	50	42	50	21	50	14	35	10	26	8	21
FO-718PL50	50	50	50	50	50	50	30	50	20	50	15	38	12	30
FO-618FGA5	5	13	3	8	2	6	1	3	1	2	1	2	1	1
FO-618FGA10	6	15	4	10	3	8	1	4	1	3	1	2	1	2
FO-618FGA25	6	15	4	10	3	8	1	4	1	3	1	2	1	2

**NOTE:** Figures in table are flow rates (US GPM) that will cause a pressure drop of 2 or 5 psi across the cartridge.

# Housing Selection Guidelines

## FILTER SIZING

1. Select the desired filter cartridge type and micrometer (micron) rating.
2. Determine the viscosity at the operating temperature for the fluid being filtered. See Bulletin 1533.
3. From the cartridge flow rate data estimate the flow rate that will result in a 2 psi differential pressure.
4. Divide the total desired flow rate by the flow rate determined in 3, above. This will give the required number of cartridges.
5. Select a filter housing that will hold the required number of cartridges.

- NOTES:** a) For double and triple length cartridges find the flow rate for the equivalent single length cartridge and multiply by 2 or 3, as appropriate. For example, the triple length five micron rated FO-644PLF5M would have 3 times the flow rate of the single length five micron rated FO-614PLF5.
- b) For recirculating lube and hydraulic oil systems where contaminant generation will be slight, it is common practice to size for a 5 psi initial pressure drop.

## CONTAMINANT CAPACITY

Velcon recommends filter cartridges be changed when they reach 25 psi differential or in accordance with your company's fuel handling procedures. The amount of contaminant a cartridge will hold before that point depends on many factors, the key one being the nature of the contaminant itself. A hard, particulate contaminant has very different filtration characteristics than a soft, gel-like contaminant.

Accurately estimating the life of a cartridge in a given application, therefore, is extremely difficult. However, when a cartridge has been sized for an initial pressure drop of 2 psi, the following rule of thumb is often employed for particulate contaminants: A 1 or 2 micrometer cartridge will hold up to 3 pounds of contaminant, and a 5 micrometer or greater cartridge will hold up to 5 pounds.

## REDUCED FLOW RATE EFFECTS

The filter sizing above is based on a 2 psi initial pressure differential which is a widely accepted industry standard. However, where heavy contaminant loads are anticipated, a substantial savings in operating costs for cartridges and filter change labor can be achieved by over-sizing the filter. **Reducing the flow rate per cartridge in half will increase the contaminant capacity of each cartridge by 30 to 50 percent. This means that doubling the size of the filter will increase the total throughput between cartridge changeouts by as much as three times.**



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