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BAG FILTER SYSTEM SIZING

IMPORTANT FACTOR TO CONSIDER WHEN SIZING FILTER BAG HOUSING APPLICATIONS

The system should be designed using a filter bag with as large a surface area as possible.

Increasing the area of a filter bag by 2 times = An increase in life for the filter bag of 3 to 4 times in addition to increasing the filter bag efficiency

SYSTEM PRESSURE DROP

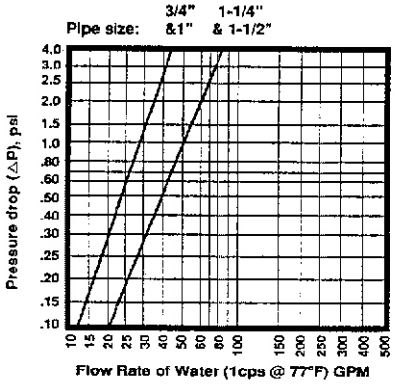
The most important factor in selecting a housing size for a filter bag application is the initial total clean pressure drop for the system, ΔPS. The pressure drop, ΔPS, consists of the pressure drop caused by the housing ΔPH with the bag basket in place plus the pressure drop caused by the filter bag ΔPB.

SYSTEM PRESSURE DROP = ΔPS = ΔPH + ΔPB

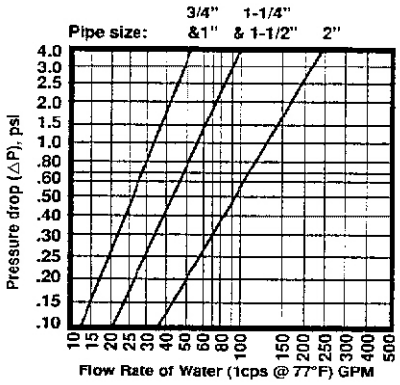
When sizing new applications, the ΔPS should be 2.0 PSI or less. The lower this value is, the more contaminant a filter bag will hold. For high contaminant loading applications, this value should be as low as possible. For applications with nominal contaminants, this value can go to 3.0 psi or more.

HOUSING PRESSURE DROP - ΔPH

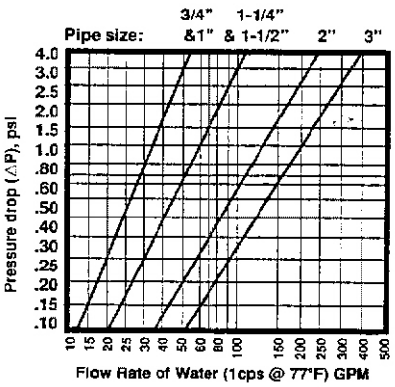
The graphs below give the clean pressure drops through the model's 50, 66, and 80 housings with a perforated filter bag basket without a filter bag installed for water, 1 cps @ 77^{0}F.



Model 50



Model 66



Model 80

To determine the pressure drop caused by the housing, ΔPH, follow these steps:

Step 1 **Using the proper housing model number pipe size & flow rate, determine the pressure drop, ΔPH, for water, 1 cps & 77°F**

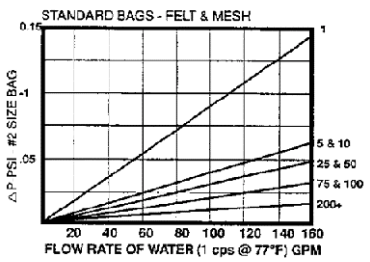
Step 2 **Multiply the value, ΔPH, obtained in step 1 by the proper viscosity corrosion factor from the table below if the liquid has a viscosity greater than 1 cps.**

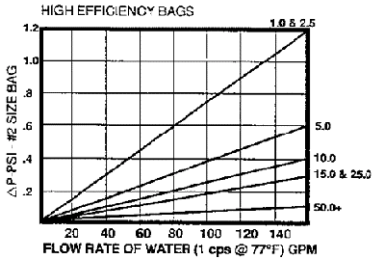
Viscosity (cps)								
1 (H_2O)	50	100	200	400	600	800	1000	2000
1.0	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.8

This is the ΔPH, the pressure drop caused by the housing and basket without the filter bag installed for the specific housing pipe size, flow rate, and liquid. The ΔPB, the pressure drop caused by the bag, must now be calculated and added to the value obtained in step 2 to obtain the system ΔP-ΔPS.

FILTER BAG PRESSURE DROP- rPB

Step 1 **The graphs show the ΔPB produced by a size number 2 bag filter for water (1 cps @ 77°F). The type of bag, the micron rating, and the flow rate determine the pressure drop.**





Step 2 **Correct the bag size from the table below if the bag filter size is not #2.**

Bag Size	Dimensions Dia x Length (in)	Correction factor
2	7.06 x 32	1.00
9	5.5 x 32	1.50
1	7.06 x 16	2.25
8	5.5 x 21	2.25
7	5.5 x 15	3.00
4	4.15 x 14	4.50
3	4.15 x 8	9.00

Step 3 **If the viscosity of the liquid is greater than 1 cps (water @ 77^{o}F) multiply the result from Step 2 by the following correction factor from the chart below.**

Viscosity (cps)	50	100	200	400	800	1000	1500	2000	4000	6000	8000	10000
Correction Factor	4.5	8.3	16.6	27.7	50	56.2	77.2	113.6	161	250	325	430

The value obtained in Step 3, ΔPB is the clean pressure drop caused by the filter bag.

SUMMARY

System pressure drop = ΔPS = ΔPH + Δ PB

For new applications, Δ PS should be 2.0 PSI or less. For high contaminant loading, this value should be as low as possible. The lower this value is, the more contaminant the bag will hold. For bags with nominal contaminants, this value can go to 30 PSI or more. Consult us for specific recommendations when the clean ΔPS exceeds 20 PSI.