Procedyne Engineers

Engineering Data
Screen Openings for Temporary Strainer

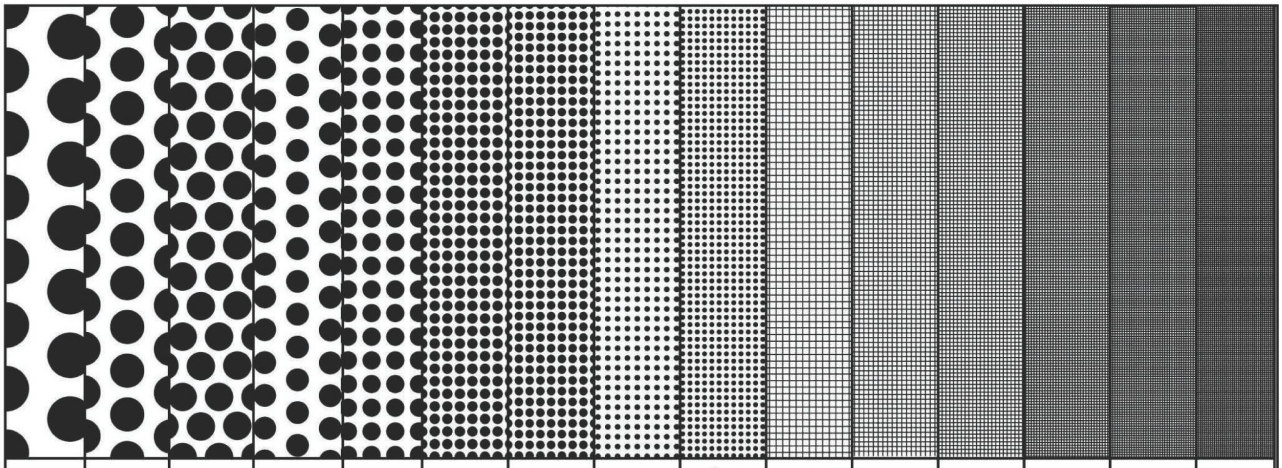
Factors To Consider

Purpose
If the basket strainer is being used for protection rather than direct filtration, PE standard screens will suffice in most applications.

Service
With services that require extremely sturdy screens, such as high pressure/ temperature applications or services with high viscosities, PE recommends that perforated screens without mesh liners be used. If mesh is required to obtain a certain level of filtration, then PE recommends a trapped perf./mesh/perf. combination.

Filtration Level
When choosing a perf. or a mesh/perf. combination attention should be given to ensure overstraining does not occur. As a general rule the specified level of filtration should be no smaller than half the size of the particle to be removed. If too fine a filtration is specified the pressure drop through the strainer will increase very rapidly, possibly causing damage to the basket.

Screen Types/Dimensions



1/4" Dia. - 40% O.A.	3/16" Dia. - 50% O.A.	5/32" Dia. - 58% O.A	1/8" Dia. - 40% O.A.	3/32" Dia. - 39% O.A	1/16" Dia. - 37% O.A.	3/64" Dia. - 36% O.A.	1/4" Dia. - 40% O.A.	0.027" Dia. - 23% O.A.	20 Mesh - 49% O.A. 0.035" Openings	30 Mesh - 45% O.A. 0.022" Openings	40 Mesh - 41% O.A. 0.016" Openings	60 Mesh - 38% O.A. 0.010" Openings	80 Mesh - 36% O.A. 0.008" Openings	100 Mesh - 30% O.A. 0.006" Openings

Notes: 1. Screen openings other than those shown above are readily available.
various mesh sizes as fine as 5 micron and perforated plate as coarse as 1/2" Dia.
2. Screens are available in a wide range of materials. various screen material in
carbon steel, stainless steel (304, 316), alloy 20, monel 400, hastalloy C and titanium grade 2.

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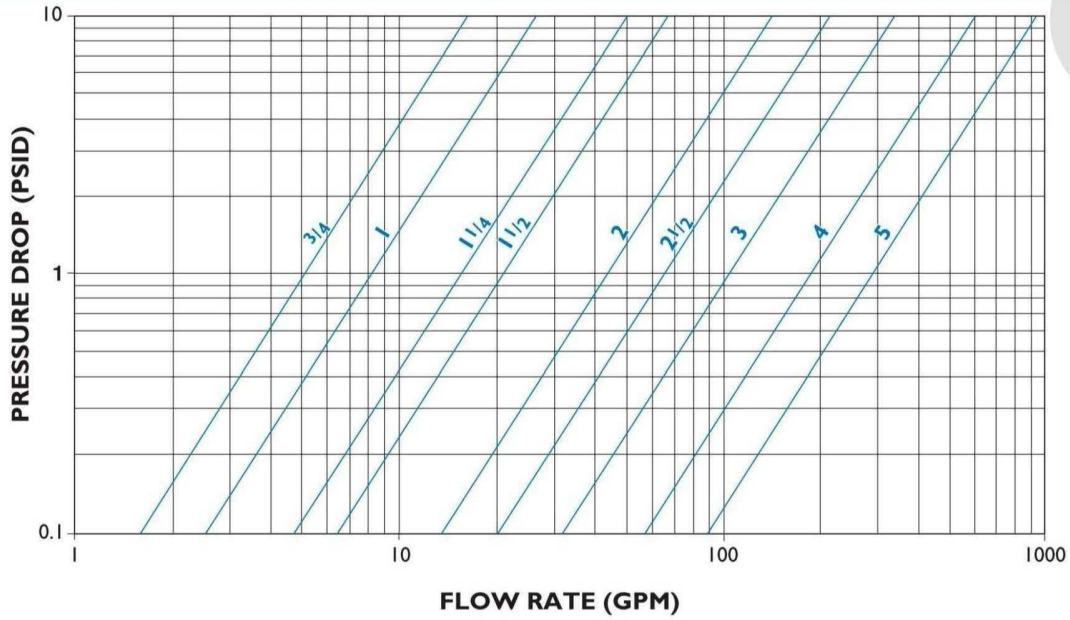
Engineering Data
Temporary Strainer Pressure Drop— Liquids

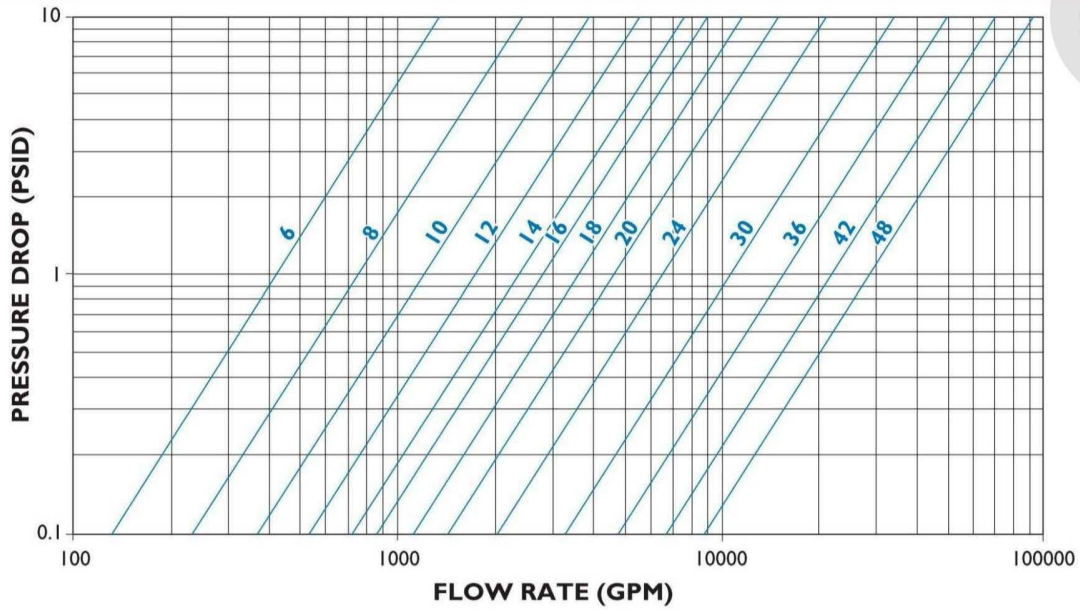
Temporary Strainer Pressure Drop — Liquids (Sizes 3/4 - 5)

FIGURE 1



Temporary Strainer Pressure Drop — Liquids (Sizes 6 - 48)

FIGURE 2



Notes: 1. Pressure drop curves are based on water flow with standard screens.

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Engineering Data
Correction Factor Charts

Screen Correction Factor Chart (For Non-Standard and Mesh Lined Screens)

*Multiply values obtained from figure 1 thru 6 by the appropriate values shown below

Chart #1

Size Range	SCREEN OPENINGS							
	Perforated Plate % Screen Material Open Area					Mesh lined standard screens % Screen Material Open Area		
	60%	50%	40%	30%	20%	50%	40%	30%
1/4" - 1 1/2"	0.45	0.55	0.7	1	1.15	1.05	1.05	1.2
2" - 48"	0.65	0.8	1	1.4	2.15	1.05	1.05	1.2

Notes: 1. Standard screens for sizes 3/4" to 1 1/2" is approximately a 30% open area screen media.
2. Standard screens for sizes 2" and larger is approximately a 40% open area screen media.

Example:

Strainer Size: 10"
Type: Fabricated Basket Strainer
Filtration: 100 Mesh lined 1/8" Perf.
Flow rate: 3000 GPM
Service: Water

A) Using figure 5 the pressure drop is determined to be 2.0 psid with PE standard screen.
B) We find that the % Open area of 100 mesh is 30%.
C) Using chart 1 we read the correction factor to be 1.2 for 100 mesh lined 1/8" perf.
D) Total pressure drop equals 2.0 x 1.2 = 2.4 psid clean.

Viscosity and Density Correction Factor Chart

Chart #2

Size Range	Component Factor (CF)
3/4" - 1 1/2"	0.25
2" - 48"	0.35

Chart #3

Viscosity Cp	Body Loss Factor (BF)	Screen Loss Factor			
		Perf alone (PF)	20 Mesh Lined (MF)	30, 40, Mesh Lined (MF)	60 to 300 Mesh Lined (MF)
10	1	1.15	1.3	1.4	1.5
25	1.2	1.25	2	2.2	2.5
100	1.6	1.4	3	4	6.5
200	2.2	1.5	4.5	7	11.5
500	4.4	1.6	10	15	25
1000	8	1.7	15	30	50
2000	15.2	1.9	30	60	100

How to Use:

1) Determine the pressure drop (P1) through the strainer with water flow and standard screens.
2) If non-standard screens (i.e. 40 mesh, etc.) are being used, apply factors in Chart #1 to determine corrected pressure drop (P2).
3) Multiply P1 or P2 (if used) by the specific gravity of the fluid actually flowing through the strainer to get P3.
4) Using Chart #2 multiply P3 by the appropriate Component Factor (CF) to get P4.
5) Let P5 = P3 - P4.
6) Multiply P4 by the appropriate Body Loss Factor (BF) in Chart #3 to get P6.
7) Multiply P5 by the appropriate Screen Loss Factor (PF or MF) in Chart #3 to get P7.
8) Total pressure drop P8 = P6 + P7.

Example:

Strainer Size: 10"
Type: Fabricated Basket Strainer
Filtration: 100 mesh lined 1/8" perf.
Flow rate: 3000 GPM
Specific Gravity: 1
Viscosity: 100 cP

A) As shown in the above example, the corrected pressure drop (P2) = 2.4 psid
B) Since S.G. = 1, P3 = P2 = 2.4 psid
C) Using Chart #2 P4 = 0.35 x P3 = 0.84 psid
D) P5 = 2.4 - 0.84 = 1.56 psid
E) Using Chart #3 P6 = 0.84 x 1.6 = 1.34 psid
F) Again using Chart #3 P7 = 1.56 x 6.5 = 10.14 psid
G) Total pressure drop P8 = 1.34 + 10.14 = 11.48 psid clean

Correction Factors For Clogged Screens

* Multiply values obtained from figures 1 thru 6 by the appropriate values shown below

Chart #4

	Ratio of Free Screen Area to Pipe Area						
% Clogged	10:1	8:1	6:1	4:1	3:1	2:1	1:1
10%	-	-	-	-	-	-	3.15
20%	-	-	-	-	-	1.15	3.9
30%	-	-	-	-	-	1.4	5
40%	-	-	-	-	-	1.8	6.65
50%	-	-	-	-	1.25	2.5	9.45
60%	-	-	-	1.15	1.8	3.7	14.5
70%	-	-	-	1.75	2.95	6.4	26
80%	-	1.1	1.75	3.6	6.25	14	58
90%	2.3	3.45	6	13.5	24	55	-

Notes: 1. For screens other than PE standard, use the following formula to calculate the ratio free area to pipe area:

$$R = \frac{Ag \times OA}{100Ap}$$

where;

R = Ratio free area to pipe area

Ag = Gross screen area, sq. in.

OA = Open area of screen media, %

Ap = Nominal area of pipe fitting, sq. in.

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