

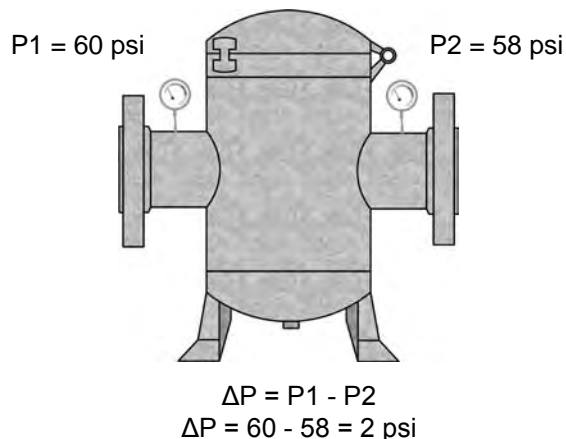
**TITAN**

# TITAN FLOW CONTROL, INC.

## Pressure Drop Charts Technical Data

### What is Pressure Drop and why is it important?

Pressure drop refers to the change in pressure across a piping component such as a valve or strainer. Screen size, mesh size and the internal flow path can greatly affect pressure drop. Pressure drop (denoted  $\Delta P$ ) can be physically measured by placing a pressure gauge at each end (inlet and outlet) of a piping component. This is illustrated in the diagram below. The pressure drop, along with size of the corresponding pipe, provides critical information when sizing and selecting the appropriate piping component.



### Pressure Drop Equations for Liquids

$$\Delta P = G * \left[ \frac{Q}{C_v} \right]^2 * CR$$

$$\Delta P = \frac{1}{4010 * \rho} * \left[ \frac{W}{C_v} \right]^2 * CR$$

Where:

G = Specific Gravity of liquid relative to at 60 °F

Q = Flow in U.S. gallons per minute (GPM)

C<sub>v</sub> = Flow coefficient factor

$\Delta P$  = Pressure Drop in pounds per square inch (PSI)

CR = Correction factor for mesh and viscosity

W = Flow rate in pounds per hour (lb/hr)

$\rho$  = Density (lb/ft<sup>3</sup>)

### How is the flow rate (GPM) and Pressure Drop related?

Generally, the higher the flow rate (GPM) through a piping component, the greater the pressure drop. Conversely, the lower the flow rate (GPM), the lower the pressure drop.

### What is the C<sub>v</sub> Factor?

The C<sub>v</sub> Factor is a physical measurement that specifies the number of gallons per minute (GPM) that can pass through a piping component with (1) psi pressure drop across the piping component.

### Pressure Drop Charts.

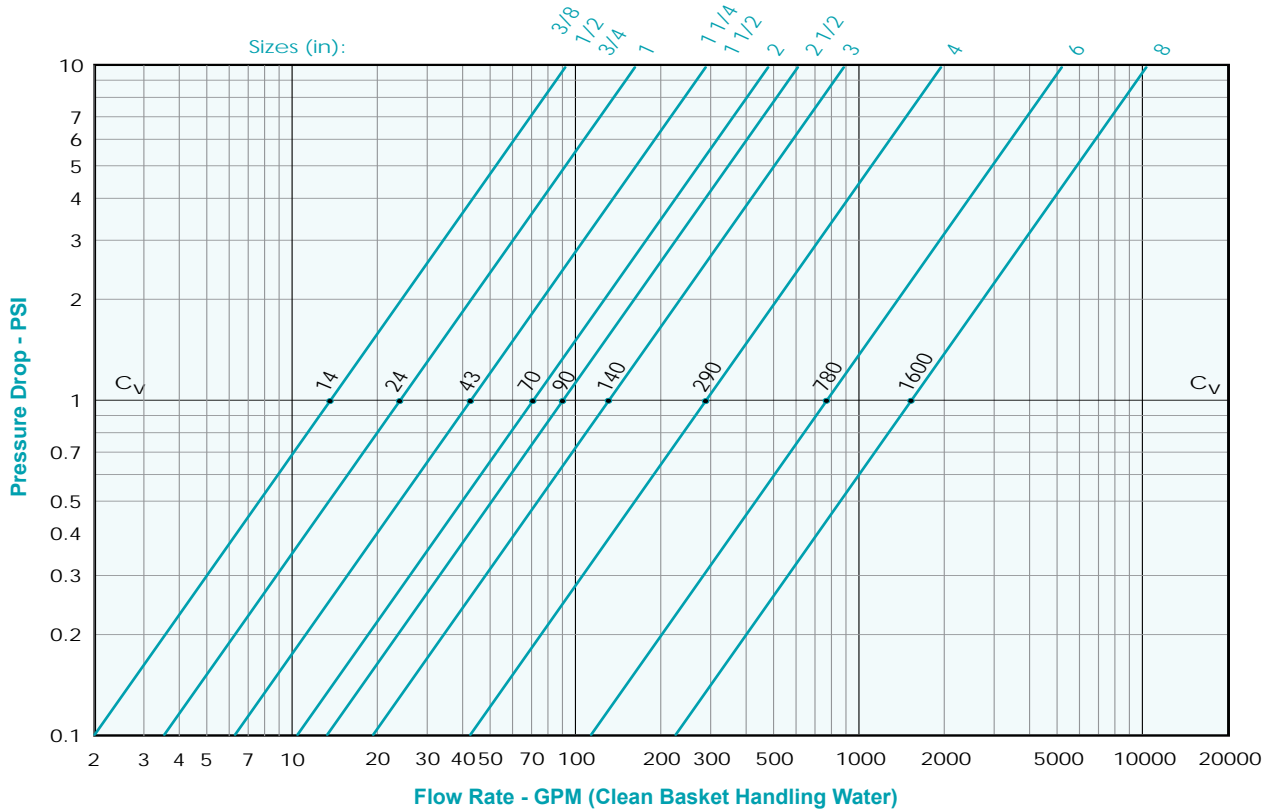
The pressure drop charts presented in this manual (for strainers) are based upon clean baskets or screens (with 1/8" diameter holes on 3/16" centers) handling water.

To determine the pressure drop for mesh lined screens handling water, multiply the pressure drop obtained from the pressure drop charts by the corresponding correction factor shown in the C<sub>v</sub> correction table.

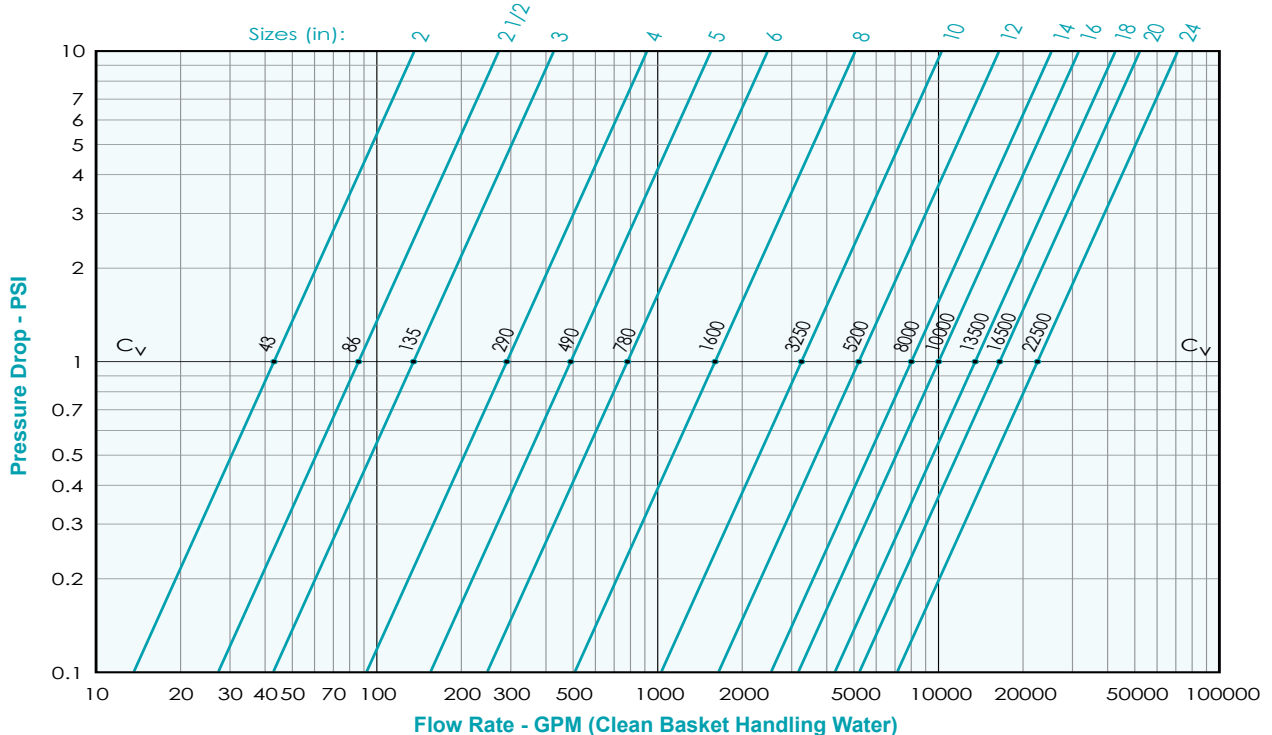
For liquids with a viscosity higher than water (For reference water has a viscosity of 30 SSU), follow these steps.

1. First, multiply the pressure drop obtained from the pressure drop charts by the specific gravity of that liquid. *There are numerous reference materials available that list the specific gravity of liquids. A comprehensive list of specific gravity values for liquids can be found at: [http://www.simetric.co.uk/si\\_liquids.ht](http://www.simetric.co.uk/si_liquids.ht)*
2. Then multiply this value obtained in step one by the correction factor from the Correction Factor Table (Shown on the last page of this manual).

## THREADED & FLANGED BASKET STRAINERS (BS25, BS25F, BS35, BS35F)



## FLANGED END BASKET STRAINERS (BS55, BS65, BS85, BS86)

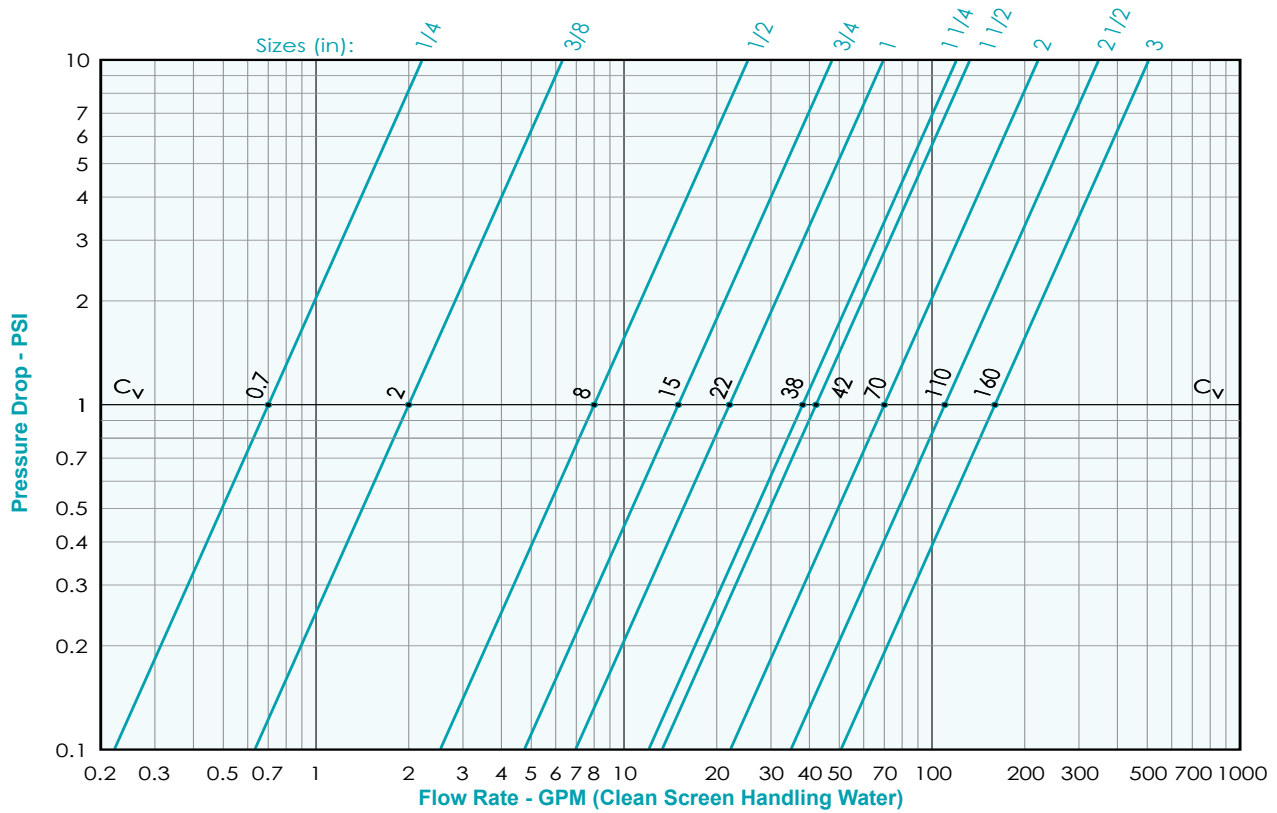


The above pressure curves are based upon clean baskets or screens (with 1/8" diameter holes on 3/16" centers) handling water. For other liquids (more viscous than water) and for mesh lined baskets, please use the Correction Factor Table.

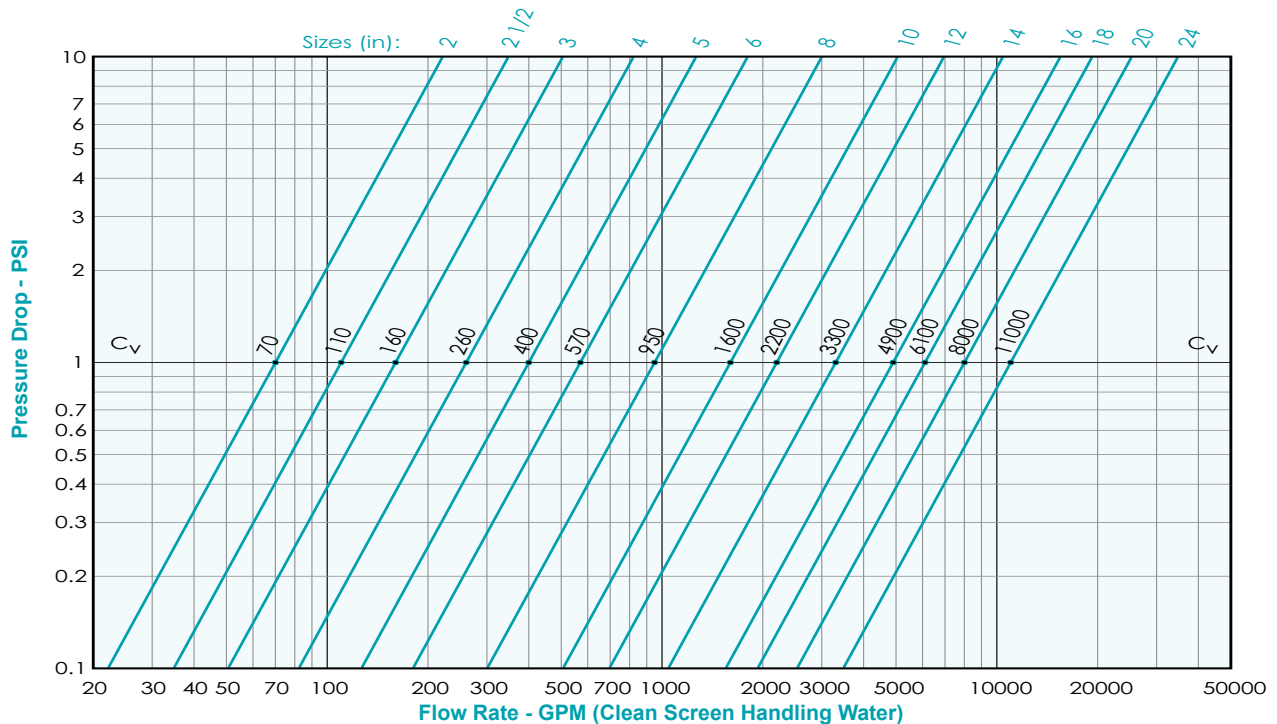


## Pressure Drop Charts - "Y" Type Strainers (Cast)

### THREADED AND WELD END "Y" TYPE STRAINERS (YS12, YS52, YS55, YS56, YS81, YS82, YS83, YS84, YS63, YS65)



### FLANGED END "Y" TYPE STRAINERS (YS58, YS59, YS54, YS61, YS62, YS64)

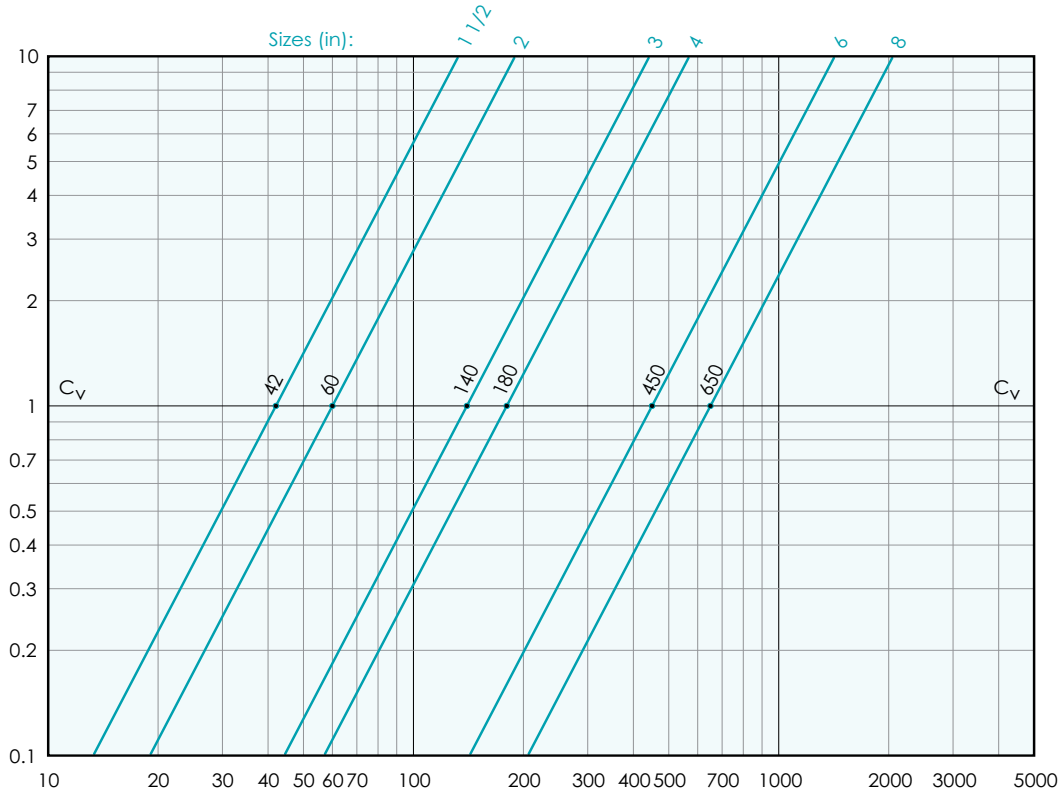


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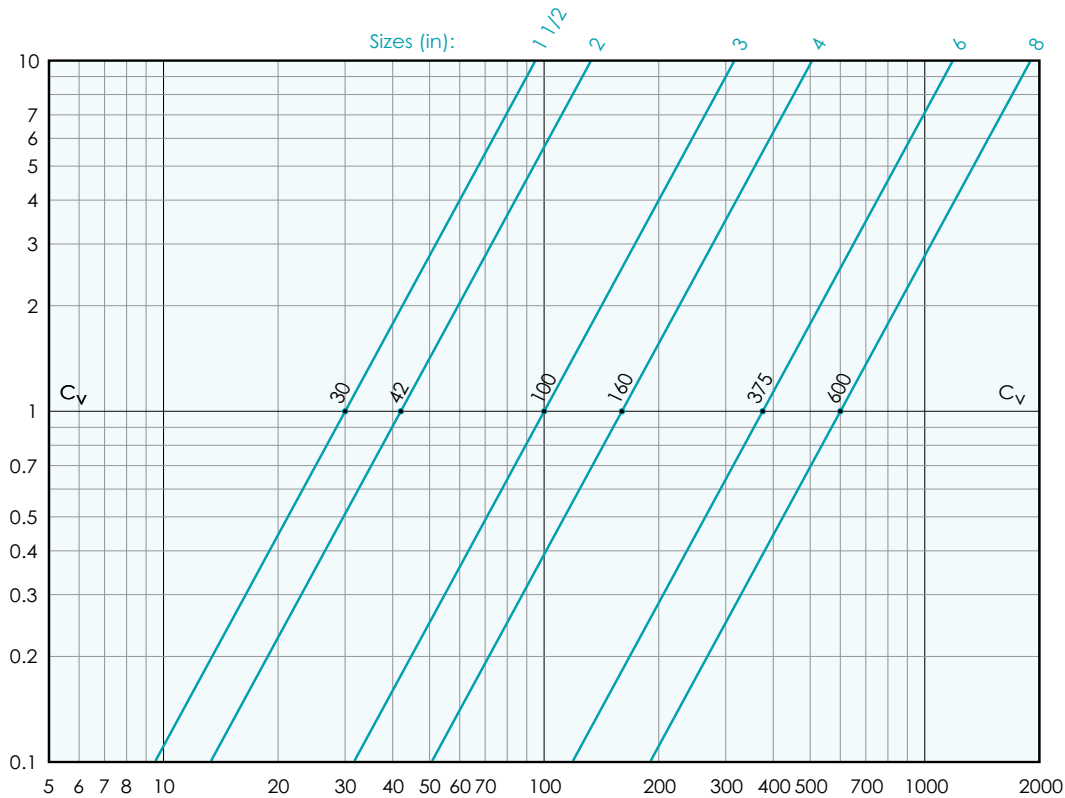


## Pressure Drop Charts - "Y" Type Strainers High Pressure

### "Y" TYPE STRAINERS CLASS 900 & 1500 BUTT WELD & FLANGED (YS66, YS67, YS68, YS69)



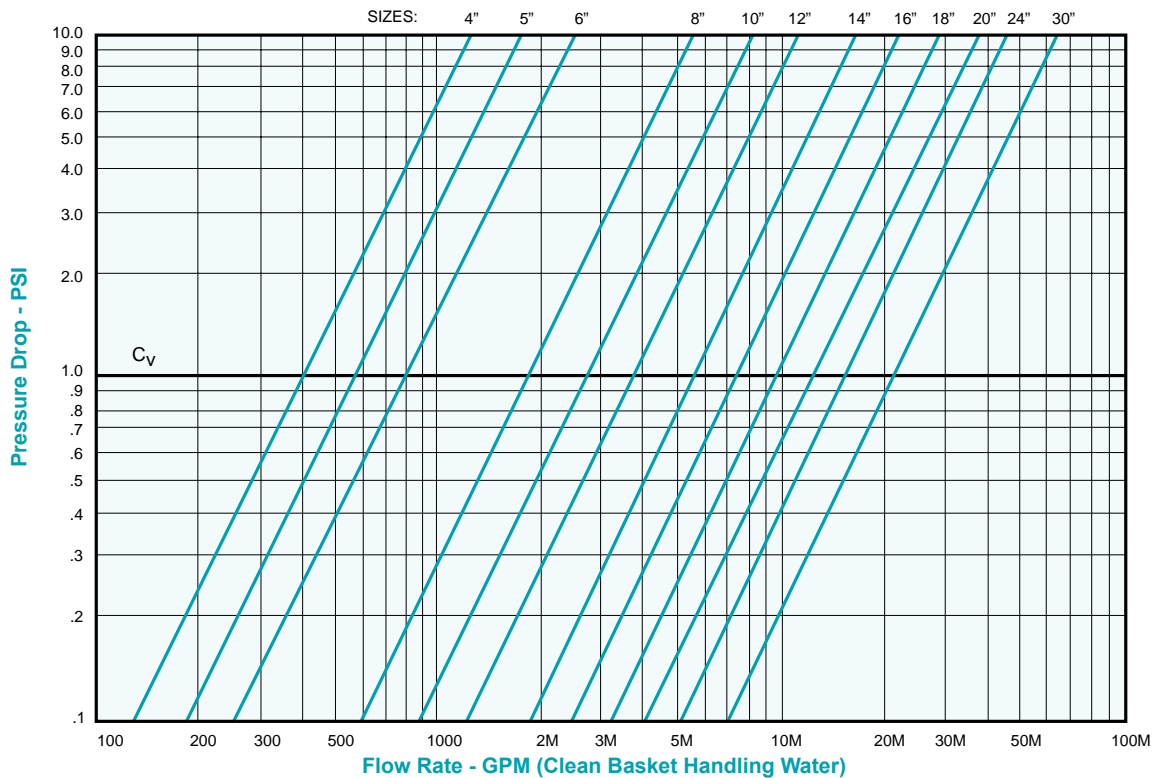
### "Y" TYPE STRAINERS CLASS 2500 BUTT WELD, SOCKET WELD, & FLANGED ENDS (YS70, YS71, YS86)



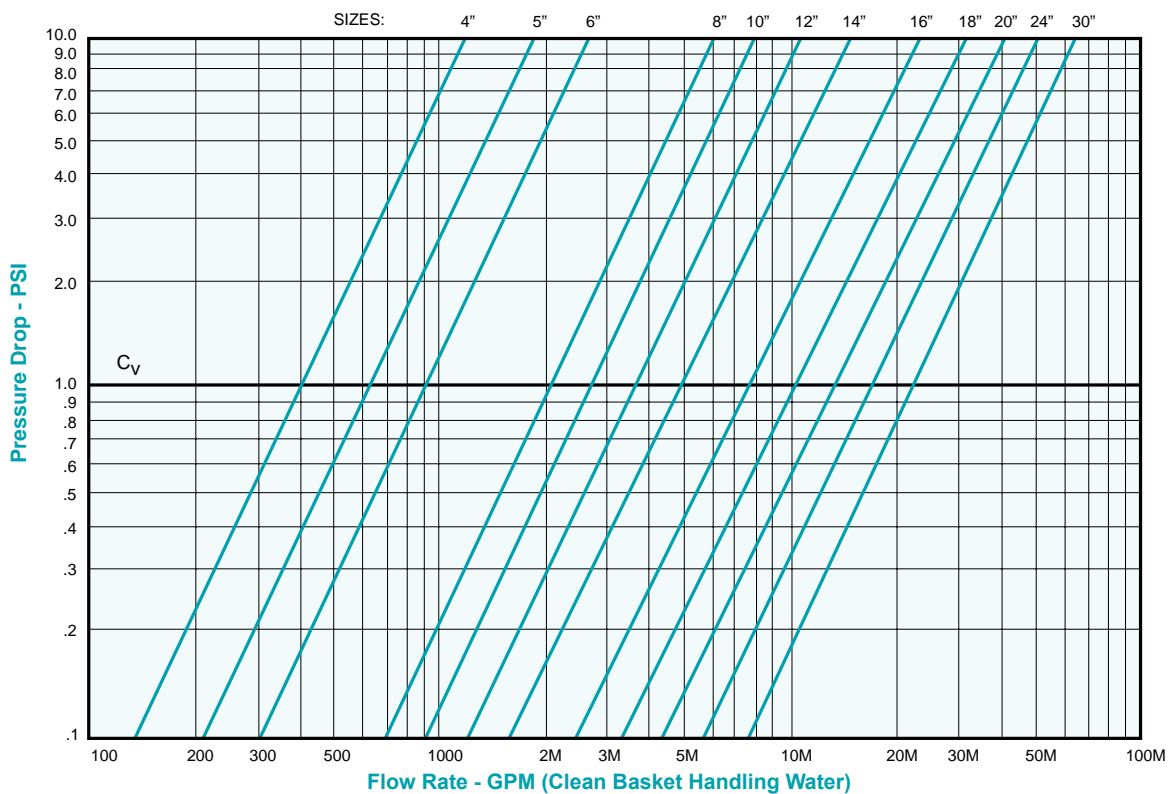
The above pressure curves are based upon clean baskets or screens (with 1/8" diameter holes on 3/16" centers) handling water.  
For other liquids (more viscous than water) and for mesh lined baskets, please use the Correction Factor Table.

## Pressure Drop Charts - Fabricated Strainers

### FABRICATED BASKET STRAINERS (FB21, FB22, FB31, FB32)



### FABRICATED TEE STRAINERS (FT10, FT30, FT11, FT21)

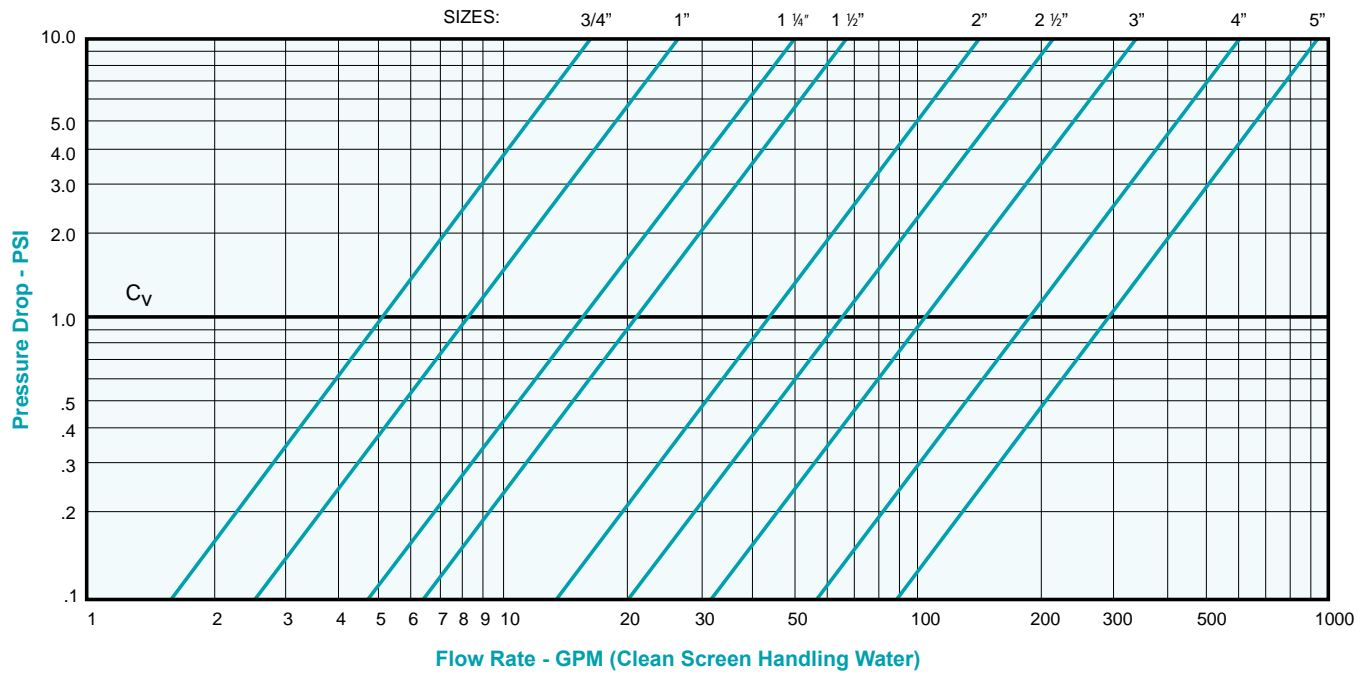


The above pressure curves are based upon clean baskets or screens (with 1/8" diameter holes on 3/16" centers) handling water.  
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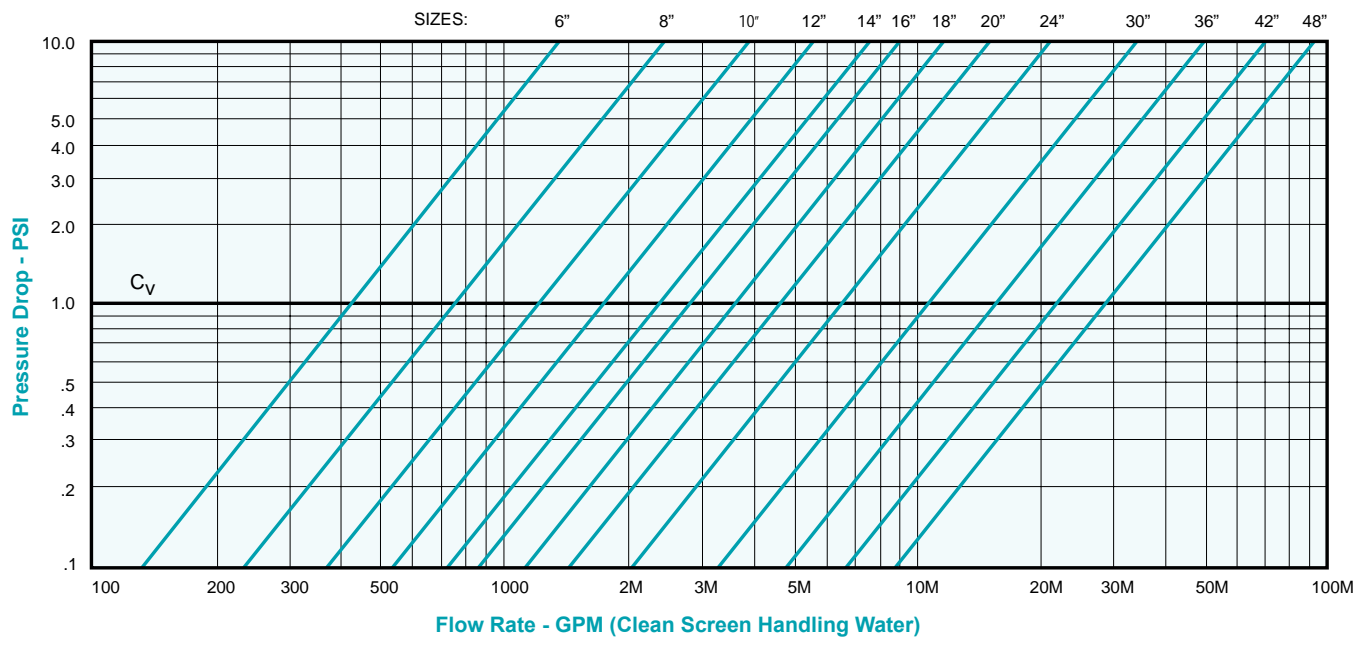


# Pressure Drop Charts - Temporary / Conical Strainers

## FABRICATED TEMPORARY STRAINERS (3/4" ~ 5") (PS15, PS16)



## FABRICATED TEMPORARY STRAINERS (6" ~ 48") (PS15, PS16)

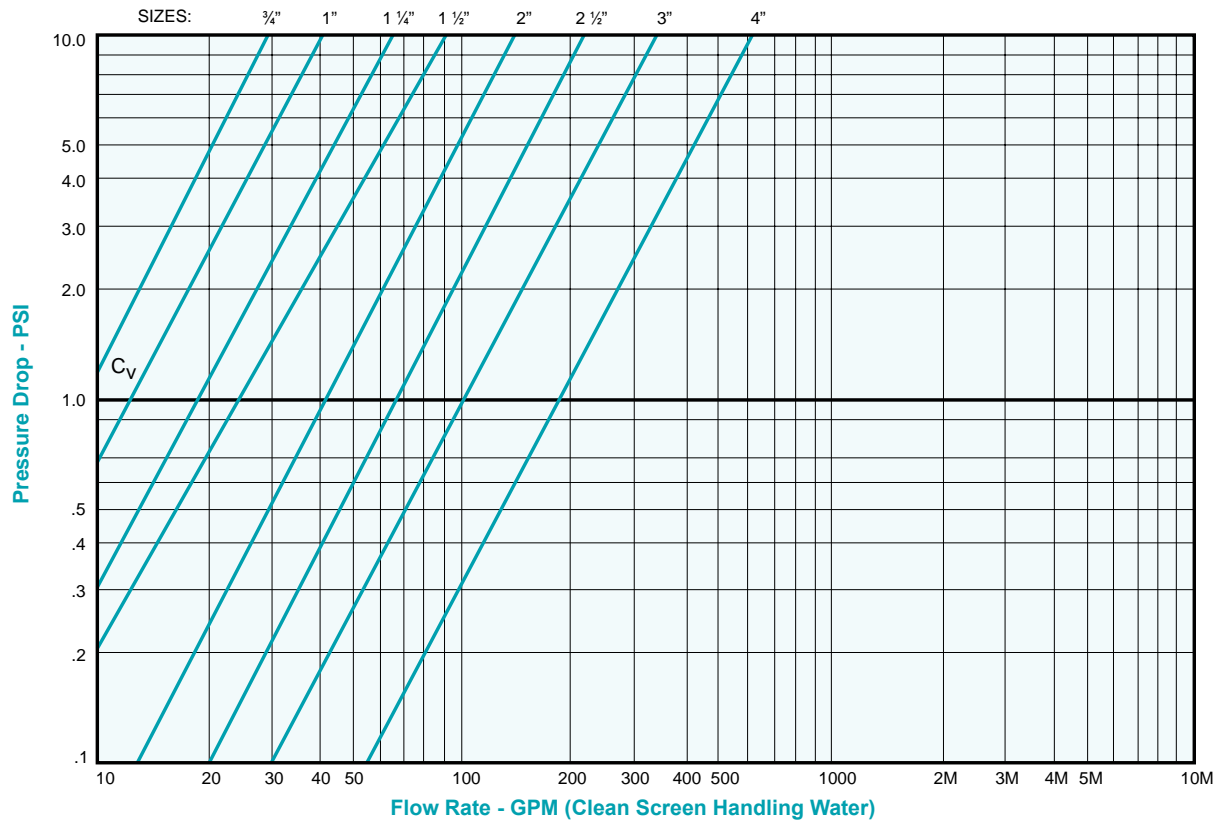


The above pressure curves are based upon clean baskets or screens (with 1/8" diameter holes on 3/16" centers) handling water. For other liquids (more viscous than water) and for mesh lined baskets, please use the Correction Factor Table.

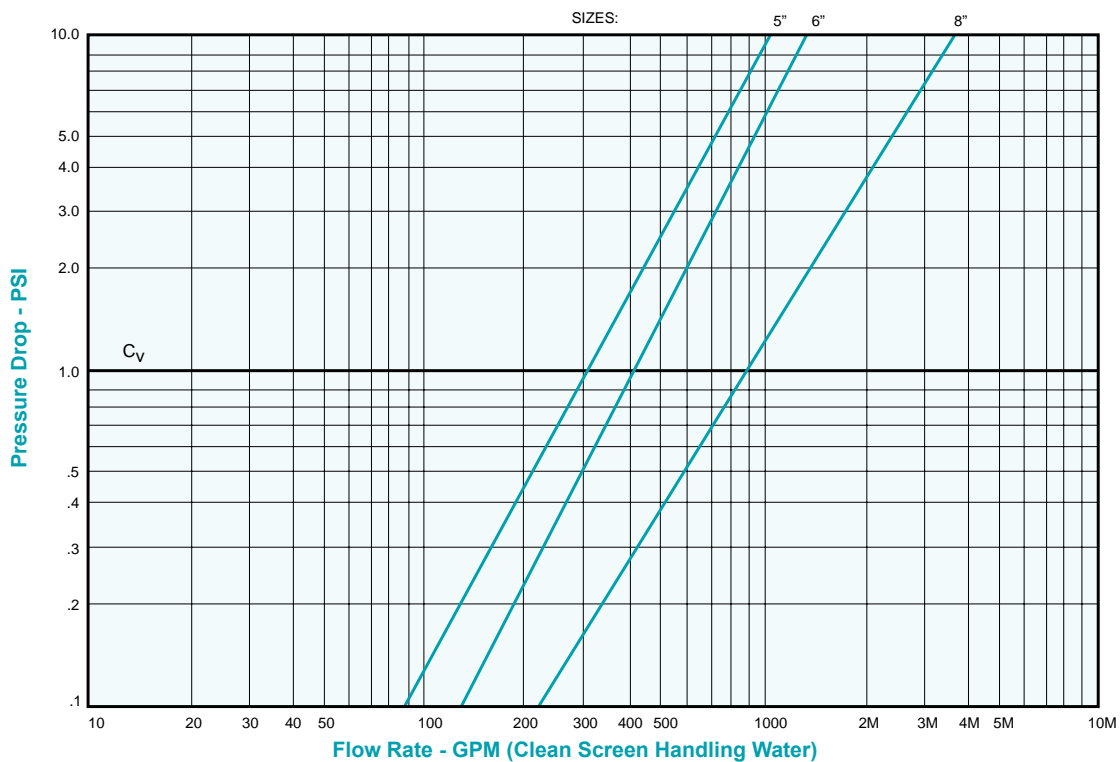


## Pressure Drop Charts - Duplex Strainers

### DUPLEX STRAINERS (3/4" ~ 4") (DS591, DS592, DS593, DS691, DS692, DS693)

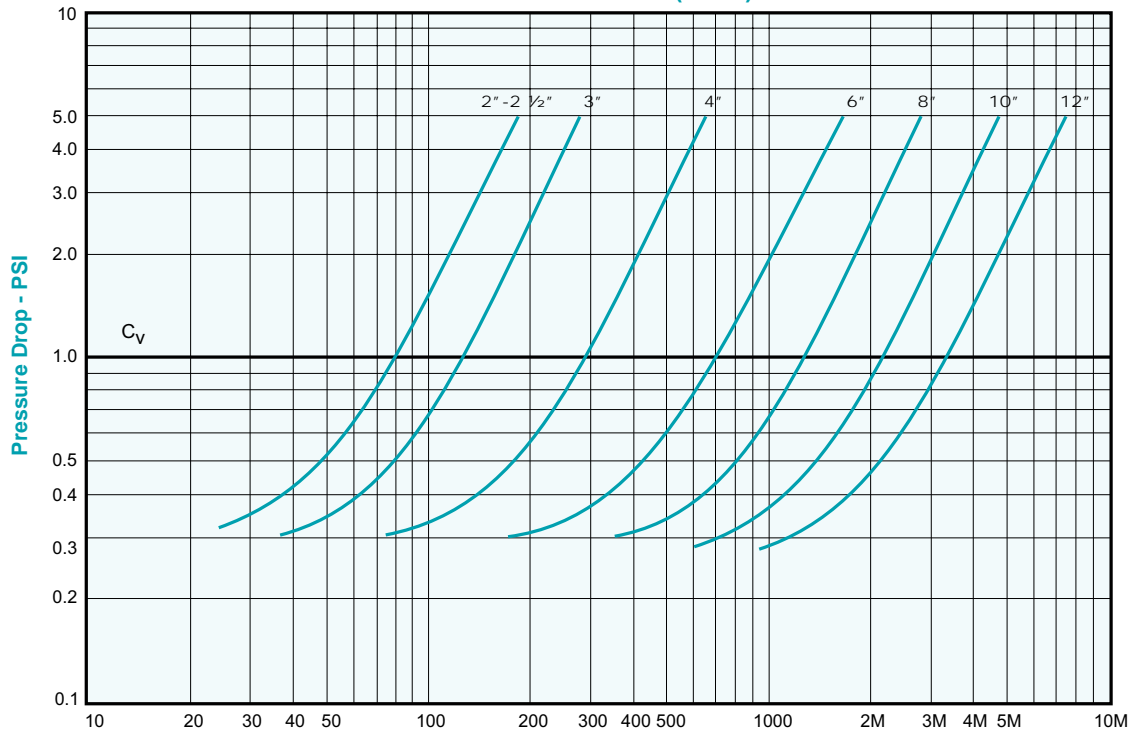


### DUPLEX STRAINERS (5" ~ 8") (DS591, DS592, DS593, DS691, DS692, DS693)



The above pressure curves are based upon clean baskets or screens (with 1/8" diameter holes on 3/16" centers) handling water.  
For other liquids (more viscous than water) and for mesh lined baskets, please use the Correction Factor Table.

## TRI-FLOW VALVES (TF21)



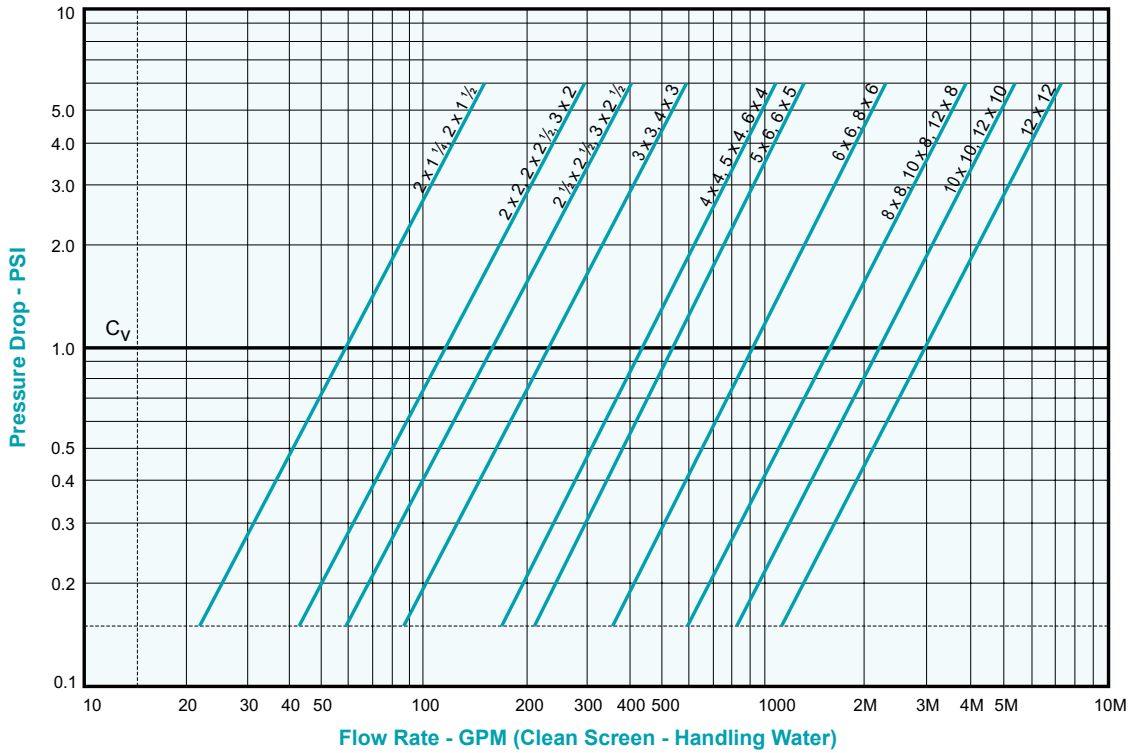
Flow Rate - GPM (100% Open - Handling Water)  
(For other % Open values, use the table below)

## TRI-FLOW VALVES (TF21)

SIZE	PRESSURE DROP (PSI)						
	% OPEN	.5 psi	1.0 ( $C_v$ ) psi	1.5 psi	2.0 psi	2 1/2 psi	3.0 psi
2", 2 1/2"	25 %	20	28	35	40	45	49
	50 %	29	40	49	54	64	70
	75 %	40	56	69	79	89	97
	100 %	56	80	98	112	125	145
3"	25 %	33	46	57	66	74	81
	50 %	48	66	71	95	105	115
	75 %	65	90	110	130	142	156
	100 %	91	125	155	180	200	220
4" & 5"	25 %	83	115	142	165	185	200
	50 %	115	160	195	225	250	275
	75 %	157	215	265	205	340	370
	100 %	220	290	360	425	465	510
6"	25 %	215	300	370	425	480	520
	50 %	290	410	500	590	650	720
	75 %	380	540	660	760	850	930
	100 %	500	700	870	1000	1120	1230
8"	25 %	450	600	750	860	960	1050
	50 %	560	800	1000	1150	1270	1400
	75 %	700	1000	1250	1400	1570	1700
	100 %	880	1260	1550	1800	2050	2200
10"	25 %	790	1100	1350	1570	1750	1950
	50 %	1000	1400	1750	2050	2250	2450
	75 %	1250	1750	2150	2500	2750	3000
	100 %	1550	2150	2650	3050	3400	3750
12" & 14"	25 %	1200	1700	2100	2450	2700	3000
	50 %	1550	2150	2650	3050	3400	3700
	75 %	1900	2650	3300	3750	4150	4650
	100 %	2400	3320	4100	4750	5250	5800

FLOW RATE (GPM)

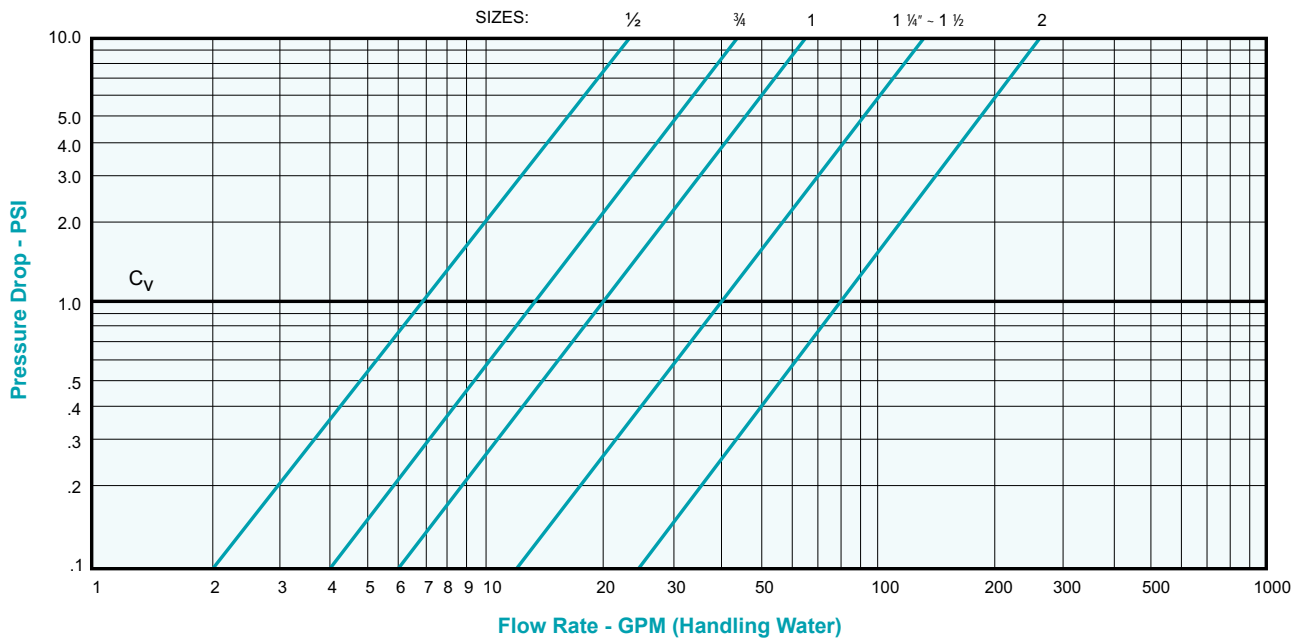
### SUCTION DIFFUSERS (SD22)



The above pressure curves are based upon clean baskets or screens (with 1/8" diameter holes on 3/16" centers) handling water. For other liquids (more viscous than water) and for mesh lined baskets, please use the Correction Factor Table.

### Pressure Drop Charts - Check Valves

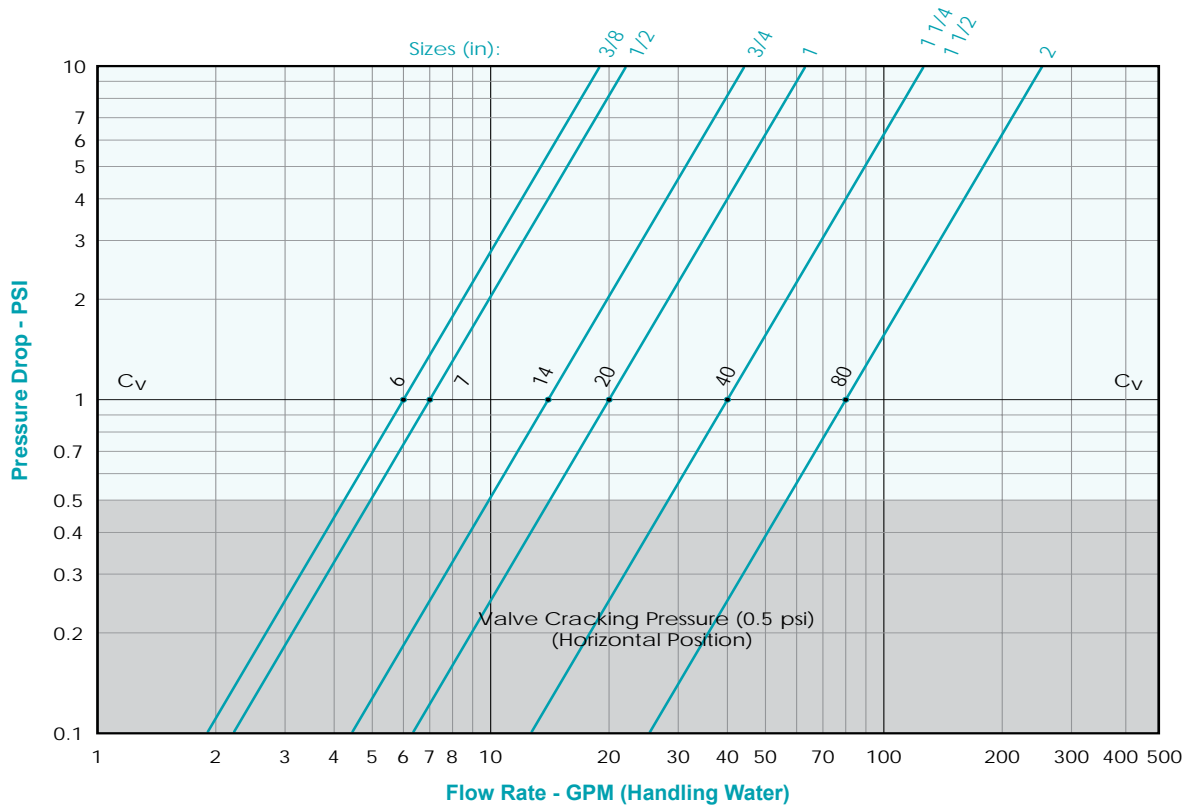
#### THREADED END - BRONZE CHECK VALVE (CV20)



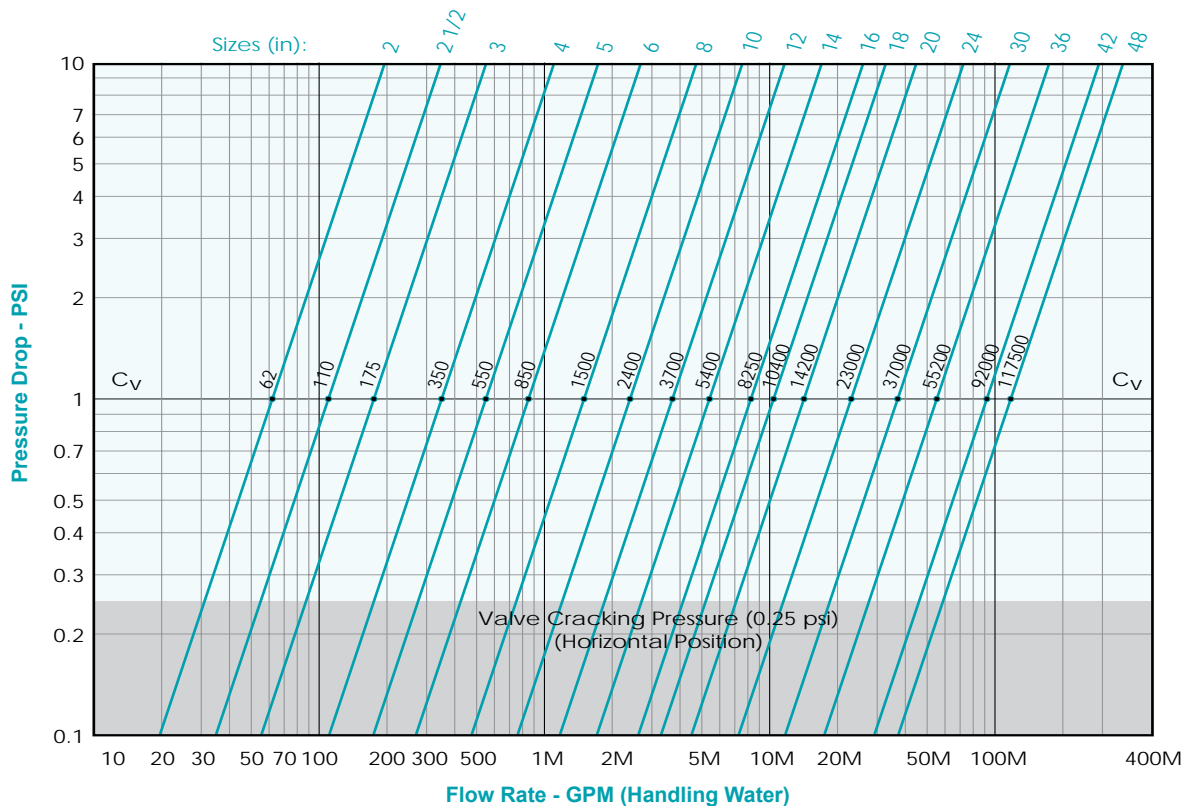


## Pressure Drop Charts - Check Valves

### THREADED END - STAINLESS STEEL CHECK VALVE (CV80)

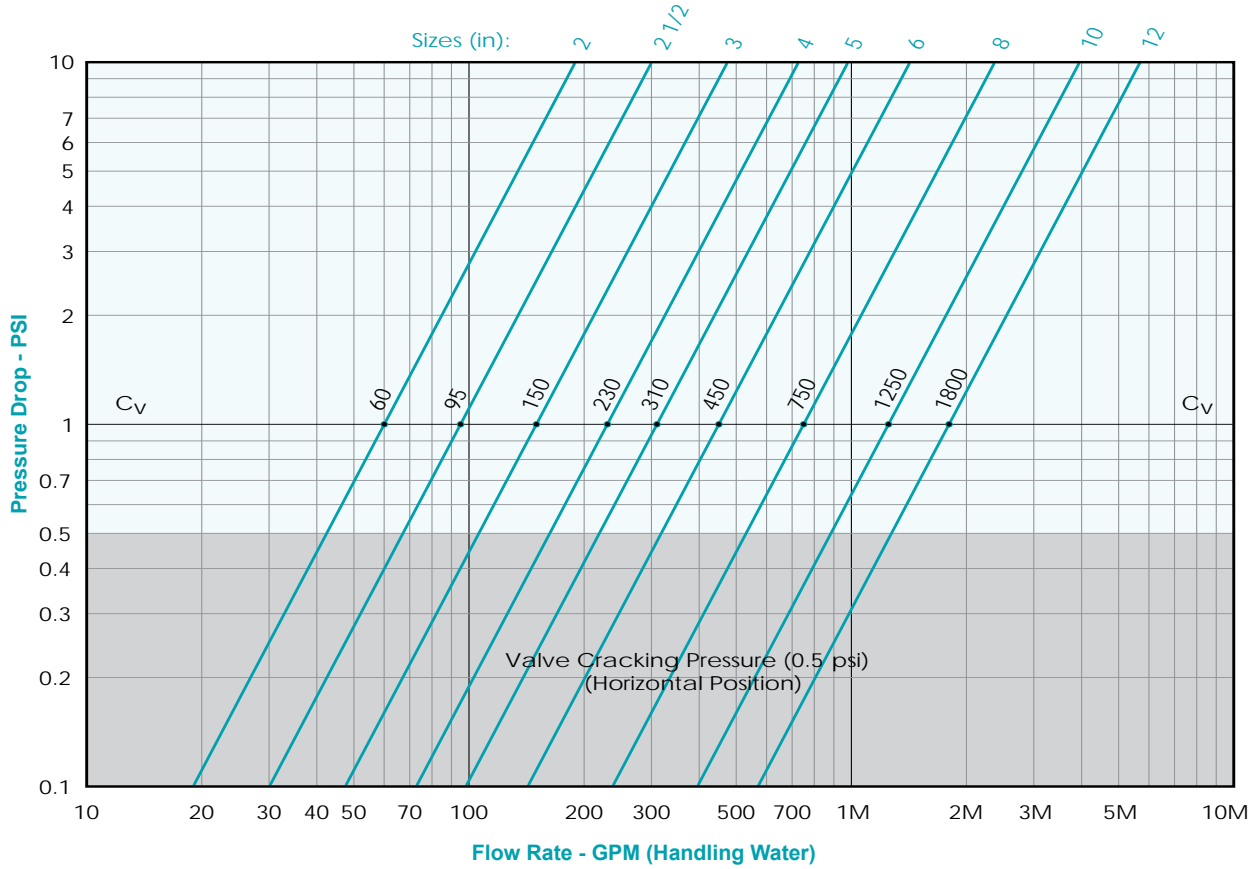


### DOUBLE DISC - WAFER CHECK VALVES (2" ~ 48") (CV41, CV42, CV44)

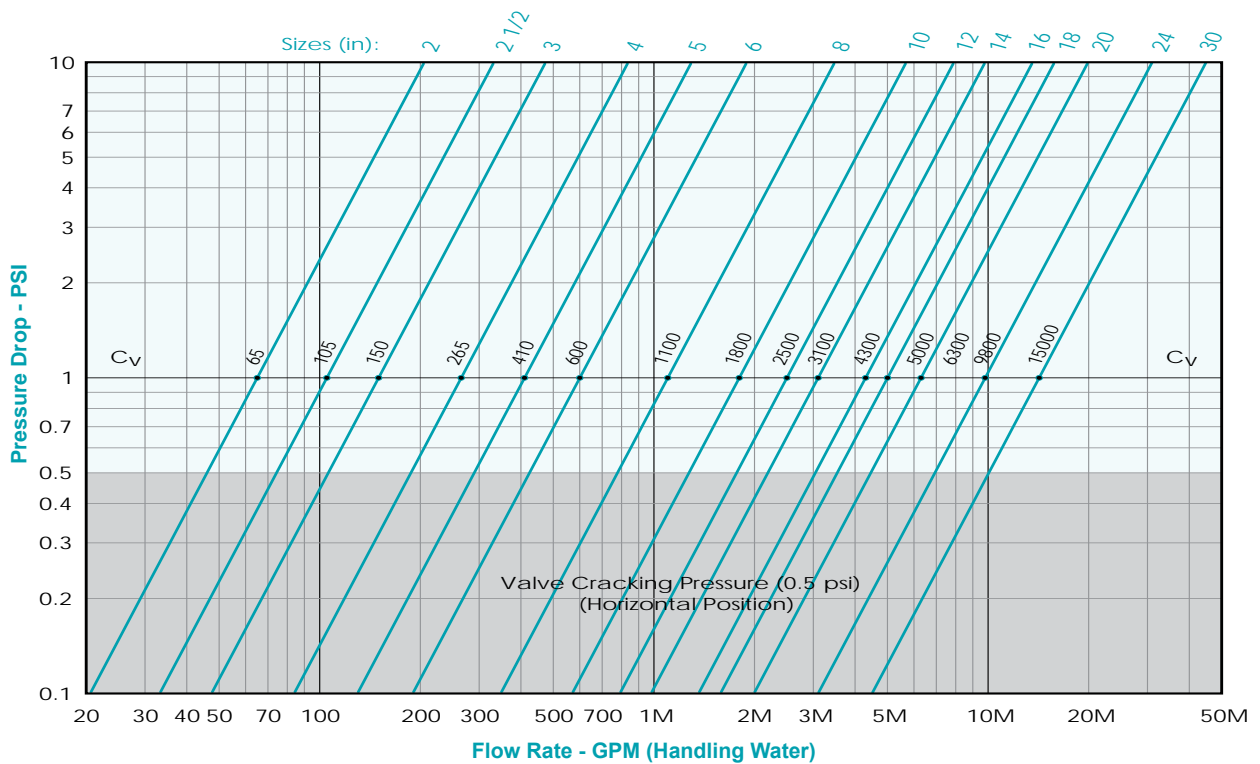


## Pressure Drop Charts - Check Valves

### WAFER TYPE SILENT CHECK VALVES (CV90, CV91)



### GLOBE TYPE SILENT CHECK VALVES (CV50, CV51, CV52)



### C<sub>v</sub> = MAXIMUM FLOW IN GPM THROUGH A STRAINER OR VALVE AT 1.00 PSI PRESSURE DROP

Model #	0.50	0.75	1.00	1.25	1.50	2.00	2.50	3	4	5	6	8	10	12	14	16	18	20	24
YS12-CI	8	15	22	38	42	70	110	160	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
YS58-CI	8	15	22	38	42	70	110	160	260	400	600	920	1600	2200	3300	4900	6100	8000	11000
YS59-CI	8	15	22	38	42	70	110	160	260	400	600	920	1600	2200	N/A	N/A	N/A	N/A	N/A
YS55-BZ	8	15	22	38	42	70	110	160	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
YS56-BZ	8	15	22	38	42	70	110	160	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
YS52-BZ	8	15	22	38	42	70	N/A	N/A	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
YS54-BZ	-----	-----	-----	-----	-----	70	110	160	260	400	600	920	1600	2200	-----	-----	-----	-----	-----
YS81/82-CS/SS	8	15	22	38	42	70	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
YS83/84-CS/SS	8	15	22	38	42	70	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
YS85/86-CS/SS	8	15	22	38	42	70	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
YS61/62/63-CS/SS	-----	-----	-----	-----	-----	70	110	160	260	400	600	920	1600	2200	-----	-----	-----	-----	-----
YS64/65-CS/SS	-----	-----	-----	-----	-----	60	90	140	180	450	650	-----	-----	-----	-----	-----	-----	-----	-----
YS68/69-CS/SS	-----	-----	-----	-----	-----	60	90	140	180	450	650	-----	-----	-----	-----	-----	-----	-----	-----
BS25/BS35	14	14	23	42	42	70	90	140	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BS55/BS65	-----	-----	-----	-----	-----	45	90	140	290	500	800	1600	3200	5000	7000	-----	-----	-----	-----
BS85/BS86	-----	-----	-----	-----	-----	45	90	140	290	500	800	1600	3200	5000	7000	-----	-----	-----	-----
FB21/FB31	-----	-----	-----	-----	-----	-----	-----	-----	400	580	800	1800	2800	3800	5800	6200	9000	12000	16000
FT10/FT20	-----	-----	-----	-----	-----	-----	-----	-----	400	580	800	1800	2800	3800	5800	6200	9000	12000	16000
PS15	-----	5	8	16	21	42	64	105	190	300	-----	-----	-----	-----	-----	-----	-----	-----	-----
PS16	-----	5	8	16	21	42	64	105	190	300	420	750	1200	1800	2300	2800	3600	4800	6500
DS691	-----	-----	13	16	21	41	64	100	190	300	400	800	-----	-----	-----	-----	-----	-----	-----
CV42/CV44	-----	-----	-----	-----	-----	62	110	175	350	550	850	1500	2400	3700	4500	5500	7500	9200	14000
CV50/CV52	-----	-----	-----	-----	-----	60	100	150	250	400	600	1100	1700	2500	3100	4100	5000	6100	10000
CV90	-----	-----	-----	-----	-----	60	90	140	210	320	460	820	1300	-----	-----	-----	-----	-----	-----
CV80	7	14	20	40	40	80	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
TF21 (100%)	-----	-----	-----	-----	-----	80	80	125	290	-----	700	1260	2150	3220	-----	-----	-----	-----	-----
SD22	-----	-----	-----	-----	60	120	160	220	420	520	900	1600	2200	3000	-----	-----	-----	-----	-----



## Correction Factor Chart for Mesh and Viscosity

**Correction Factor Chart**  
(To be used in conjunction with strainer pressure loss calculations.)

VISCOSITY		PERF. (UNLINED)	CORRECTION FACTOR TABLE												
Centistokes	(SSU)		PERFORATED WITH WIRE CLOTH												
			20	40	60	80	100	120	150	200	300	25	10	5	
			MESH	MESH	MESH	MESH	MESH	MESH	MESH	MESH	MESH	Micron	Micron	Micron	
2	30 (Water)	1.00	1.05	1.2	1.4	1.6	1.7	1.8	2.0	2.2	2.35	3.0	3.5	4.0	
10	60	1.1	1.15	1.4	1.5	1.7	1.8	2.2	2.3	2.4	2.55	---	---	---	
20	100	1.2	1.25	1.5	1.6	1.9	2.1	2.35	2.45	2.6	2.75	---	---	---	
32	150	1.3	1.35	1.6	1.7	2	2.2	2.45	2.85	3	3.15	---	4.0	---	
43	200	1.4	1.45	1.7	1.8	2.1	2.3	2.55	3.0	3.2	3.35	4.0	---	---	
54	250	1.45	1.5	1.75	1.85	2.2	2.35	2.65	3.1	3.3	3.4	---	---	---	
76	350	1.5	1.6	1.8	1.9	2.3	2.45	2.75	3.2	3.4	3.5	---	---	---	
100	500	1.6	1.7	1.9	2.1	2.4	2.6	2.8	3.35	3.6	3.75	---	---	---	
162	750	1.65	1.9	2.1	2.3	2.5	2.7	2.9	3.5	3.7	3.9	---	---	---	
216	1000	1.7	2.0	2.2	2.4	2.6	2.8	3.0	3.6	3.8	4.0	---	---	---	
325	1500	1.8	2.1	2.3	2.6	2.75	3	3.2	3.8	4.1	4.3	---	---	---	
433	2000	1.9	2.2	2.4	2.7	2.9	3.2	3.4	4.05	4.6	5.5	---	---	---	
650	3000	2.0	2.3	2.6	2.9	3.5	3.5	3.8	4.6	5.0	5.2	---	---	---	
866	4000	2.1	2.45	2.8	3.15	3.6	3.9	4.2	4.9	---	---	---	---	---	
1083	5000	2.2	2.6	3	3.4	3.8	4.2	4.6	---	---	---	---	---	---	
1624	7500	2.35	2.8	3.4	3.8	4.3	4.75	---	---	---	---	---	---	---	
2200	10000	2.5	3.0	3.5	4.0	4.5	5.0	---	---	---	---	---	---	---	
3000	13500	3.0	3.5	---	---	---	---	---	---	---	---	---	---	---	
5000	22500	4.0	4.5	5.0	5.5	6.0	6.5	7.5	8.0	8.5	9.0	9.5	10.0	10.5	
6000	27300	4.2	---	---	---	---	---	---	---	---	---	---	---	---	
15000	67000	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	
18900	86000	8.0	8.5	---	---	---	---	---	---	---	---	---	---	---	
20000	89300	8.5	9.0	---	---	---	---	---	---	---	---	---	---	---	

These multipliers should be used to determine pressure drops for filters fitted with mesh lining or handling liquids of viscosity other than water.