FIL-TREK

Fischer-Robertson, Inc.
3890 Symmes Road
Hamilton, OH 45015
ph 513-860-3445 fx 513-860-4744
www.fischer-robertson.com

T Strainers

96 Series

- Carbon or Stainless Steel
- Flanged or Buttweld
- Sizes from 2" to 36"

Fabricated ASME Code ("U" or "UM") and non-code design T strainers.

SUITABLE USES

Air & Gas | Desalination | Coolant | Water | Electronics | Coatings

Oil & Gas | Chemical | Pulp & Paper | Power | Marine | Equipment

RATINGS	▪ ASME Class 150 ▪ ASME Class 300 ▪ ASME Class 600 ▪ ASME Class 900 ▪ ASME Class 1500 ▪ ASME Class 2500
DESIGN PRESSURE	Up to 3700 @ 800° F (427° C)
AVAILABLE MATERIALS	Carbon or Stainless Steel 304 or 316, LDX2101, C276, AL6XN, 2205, 2507 & Monel 400, Titanium and other materials.
ADDITIONAL FEATURES	Swing bolt or thru-bolt closures available Vertical or horizontal configuration

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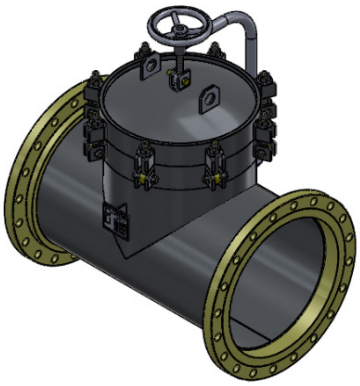
STRAINER SPECIFICATIONS

Inlet/Outlet	2" TO 36" *Larger sizes available, contact Fil-Trek*
Vent	1/2"*
Internals MOC	SS304 (for CS and SS304) SS316 (for SS316) *Other materials available*
Standard Pressure	See Pressure & Temperature Designation table
Standard Temperature	See Pressure & Temperature Designation table
Certifications	U, UM, CE, NB, CRN, CE



PRESSURE & TEMPERATURE DESIGNATION

DESIGNATION	MOC	PRESSURE	TEMP (°F)	ANSI RATING
PT1	CS	285	100	ANSI 150
	SS304/SS316	270		
PT2	CS	200	400	ANSI 150
	SS304/SS316	190		
PT3	CS	740	100	ANSI 300
	SS304/SS316	720		
PT4	CS	635	400	ANSI 300
	SS304/SS316	495		
PT5	CS	1480	100	ANSI 600
	SS304/SS316	1440		
PT6	CS	1270	400	ANSI 600
	SS304/SS316	995		
PT7	CS	2215	100	ANSI 900
	SS304/SS316	2155		
PT8	CS	1900	400	ANSI 900
	SS304/SS316	1490		
PT9	CS	3700	100	ANSI 1500
	SS304/SS316	3595		
PT10	CS	3170	400	ANSI 1500
	SS304/SS316	2485		
PT11	CS	6150	100	ANSI 2500
	SS304/SS316	5995		
PT12	CS	5200	400	ANSI 2500
	SS304/SS316	4140		

**Table above based on ANSI flange ratings. Fil-Trek will design based on application pressure and temperature requirements.*

PRODUCT NOMENCLATURE

S4	96	D1	B	6	BW	PT2	-
MOC	**MODEL**	**STYLE/ CONFIGURATION**	**CLOSURE STYLE**	**INLET/ OUTLET**	**CONNECTION**	**PRESSURE CLASS**	**ADDITIONAL OPTIONS**
(-) Carbon Steel S4 - SS304 S6 - SS316	96 – T Series Strainers	D1 – Inline D2 – 90° Top to Side D3 – 90° Side to Top	A – Swing-bolt closure B – ANSI/Thru-bolt closure	See Table	F - Raised Face Flange BW - Butt Weld ***See Page 3 for other options*	See Pressure & Temperature Designation table	See "Strainer Options" on Page 3 for: **Finish** options **Basket Perf/Mesh** options **O-Ring/Gasket** options **Cover/Headlift** Options

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STRAINER OPTIONS

*Indicates standard configuration

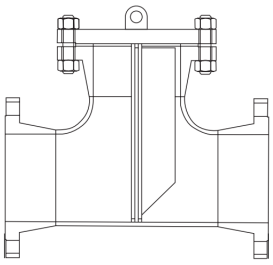
Series /Style Configuration Options	**D1 - Inline*** D2 - 90° Top to Side D3 - 90° Side to Top
Closure Style	A - Swing-bolt closure B - ANSI/Thru-bolt closure
Connection Options**	**F – Raised Face Flange*** **BW – Butt Weld (Sch 10 to 160)*** ***Other Available Options:*** Flat Face Flange Ring Joint Flange Grooved Socket Weld NPT Threaded Wafer Flat Face (Smooth Finish) Wafer Flat Face (Serrated Finish) Wafer Ring Joint ***Based on standard of construction*

Basket/Mesh Options *(See Screen Openings chart for more options)*	PERF OPTIONS	MESH OPTIONS
	1/8"*	10
	3/16"	20
	1/4"	30
	3/8"	40
	1/2"	50
	5/8"	60
	3/4"	80
	7/8"	100
	1"	120

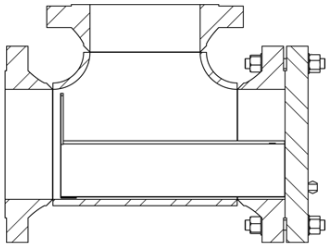
Cover Options**	**Predetermined by Series Number*** ***Other Available Options:*** Bolted Cover (Gasket Seal) w/ Davit Yoke Cover (O-Ring Seal) Quick Opening Threaded Cover (O-Ring Seal) Quick Opening C-Clamp Cover (O-Ring Seal) Grooved ***Based on standard of construction* *See page 10 for other closure/cover options*

O-Ring/Gasket Options	**For A Configurations:** **BN - Buna-N*** EP - EPDM VI - Viton SI - Silicone TEV - Teflon encap. Viton	**For B Configurations:** **Spiral Wound Flexitallic*** Garlon Vegetable Fibre
	Other materials available, contact factory	

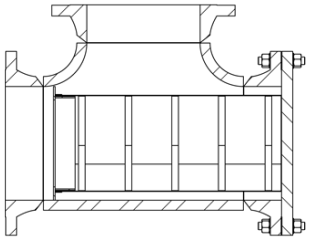
96A - Inline



96B - 90° Top to Side



96C - 90° Side to Top



FIL-TREK

T96DS-11-18

T Strainers

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MODEL DIMENSIONAL DETAILS

96D1A SERIES (INLINE W/ SWING BOLT)

	150#			300#			600#			WT (LBS) 150#			WT (LBS) 300#		
SIZE	A	B1	B2	A	B1	B2	A	B1	B2	CVR	FLG	BW	CVR	FLG	BW
2															
3															
4															
5															
6															
8															
10															
12															
14															
16															
18															
20															
24															
26															
28															
30															
32															
34															
36															

600# not available in all body diameters.
Not available for 900#, 1500# and 2500# ratings.
All quotes will include certified drawings.
Contact Fil-Trek for dimensional information.

**Specifications listed above are for reference only, Fil-Trek will provide accurate weights and dimensions at time of quoting.*

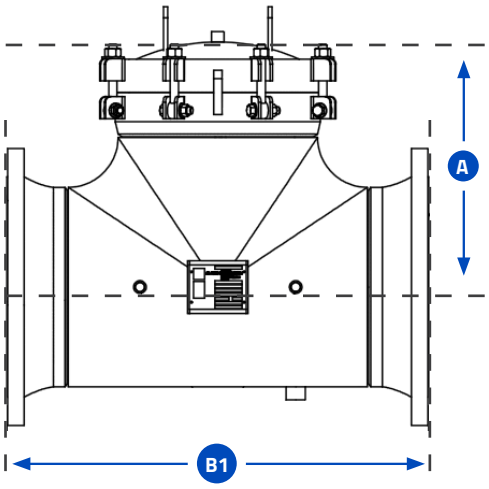
CHART LEGEND

A Height (center to top)

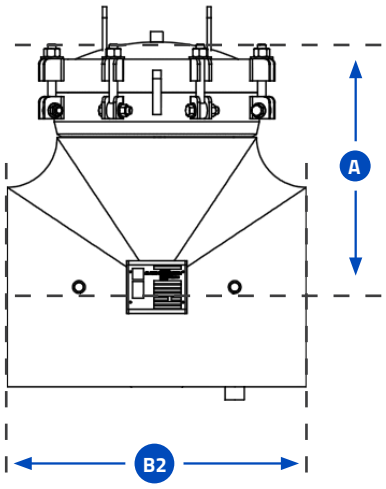
B1 Width - Flanged (face to face)

B2 Width - ButtWeld (face to face)

FLANGED



BUTT WELD



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MODEL DIMENSIONAL DETAILS

96D1B SERIES (INLINE W/ THRU BOLT)

	150#			300#			600#			900#			1500#			WT (LBS) 150#			WT (LBS) 300#		
SIZE	A	B1	B2	A	B1	B2	A	B1	B2	A	B1	B2	A	B1	B2	CVR	FLG	BW	CVR	FLG	BW
2	5.1	10.1	5.0	5.3	10.6	5.0	5.7	11.4	5.0	6.8	13.6	5.0	6.8	13.6	5.0	5	28	16	8	42	24
3	6.2	12.3	6.8	6.6	13.1	6.8	6.9	13.8	6.8	7.7	15.3	6.8	8.3	16.6	6.8	9	52	32	16	72	42
4	7.2	14.3	8.3	7.6	15.1	8.3	8.4	16.8	8.3	8.9	17.8	8.3	9.3	18.6	8.3	17	79	49	27	125	75
5	8.4	16.8	9.8	8.8	17.6	9.8	9.7	19.3	9.8	10.2	20.3	9.8	11.3	22.6	9.8	20	105	67	35	160	96
6	9.2	18.3	11.3	9.6	19.1	11.3	10.3	21.1	11.3	11.4	22.8	11.3	12.7	25.3	11.3	26	140	92	50	225	141
8	11.1	22.1	14.0	11.4	22.9	14.0	12.6	25.1	14.0	13.7	27.4	14.0	15.7	31.4	14.0	45	230	152	81	350	216
10	12.6	25.1	17.0	13.2	26.3	17.0	14.8	29.6	17.0	16.1	32.1	17.0	18.8	37.6	17.0	70	325	221	124	495	313
12	14.6	29.1	20.0	15.2	30.3	20.0	16.4	32.8	20.0	18.2	36.4	20.0	21.4	42.8	20.0	110	500	340	185	765	485
14	16.1	32.1	22.0	16.7	33.3	22.0	17.8	35.6	22.0	19.8	39.4	22.0	23.1	46.1	22.0	140	710	490	250	1025	665
16	17.1	34.1	24.0	17.8	35.6	24.0	19.3	38.6	24.0	20.8	41.6	24.0	24.6	49.1	24.0	180	860	580	295	1320	820
18	19.1	38.1	27.0	19.8	39.6	27.0	21.1	42.1	27.0	22.8	45.6	27.0	26.7	53.4	27.0	220	1025	725	395	1700	1060
20	20.8	41.4	30.0	21.4	42.9	30.0	22.8	45.6	30.0	25.1	50.1	30.0	29.3	58.6	30.0	285	1350	990	505	2250	1450
24	23.1	46.1	34.0	23.7	47.3	34.0	25.3	50.6	34.0	28.8	57.6	34.0	33.3	66.6	34.0	430	2100	1580	790	2340	2240
26	For sizes 26-36, contact Fil-Trek for dimensional information																				
28																					
30																					
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34																					
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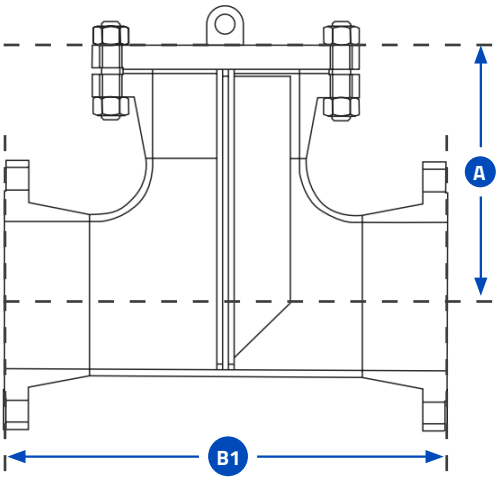
CHART LEGEND

A Height (center to top)

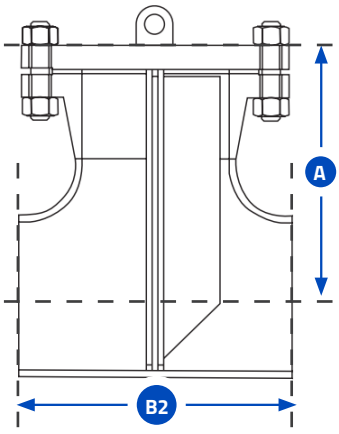
B1 Width - Flanged (face to face)

B2 Width - ButtWeld (face to face)

FLANGED



BUTT WELD



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T Strainers

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MODEL DIMENSIONAL DETAILS

96D2A SERIES (90° TOP TO SIDE W/ SWING BOLT)

	150#				300#				600#				WT (LBS) 150#			WT (LBS) 300#		
SIZE	A1	A2	B1	B2	A1	A2	B1	B2	A1	A2	B1	B2	CVR	FLG	BW	CVR	FLG	BW
2																		
3																		
4																		
5																		
6																		
8																		
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CHART LEGEND

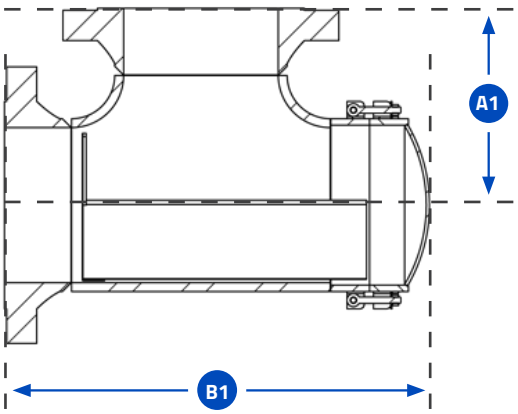
A1 Height - Flanged (center to top)

A2 Height - Butt Weld (center to top)

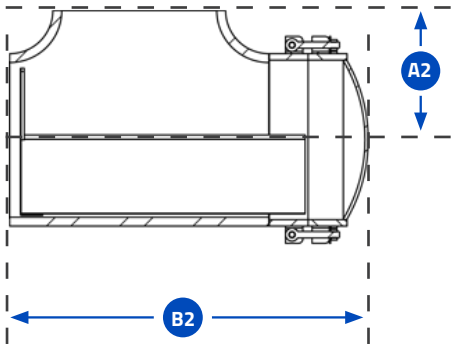
B1 Width - Flanged (face to face)

B2 Width - ButtWeld (face to face)

FLANGED



BUTT WELD



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MODEL DIMENSIONAL DETAILS

96D2B SERIES (90° TOP TO SIDE W/ THRU BOLT)

	150#				300#				600#				WT (LBS) 150#			WT (LBS) 300#		
SIZE	A1	A2	B1	B2	A1	A2	B1	B2	A1	A2	B1	B2	CVR	FLG	BW	CVR	FLG	BW
2	5.1	2.5	10.9	8.3	5.4	2.5	11.6	8.6	5.6	2.5	12.5	9.4	5	28	16	8	42	24
3	6.3	3.4	13.4	10.4	6.6	3.4	14.3	11.0	6.9	3.4	15.3	12.8	9	52	32	16	72	42
4	7.3	4.1	15.4	12.2	7.6	4.1	16.4	12.9	8.4	4.1	18.5	14.3	17	79	49	27	125	75
5	8.5	4.9	17.4	14.2	8.9	4.9	19.1	15.0	9.6	4.9	21.3	16.5	20	105	67	35	160	96
6	9.3	5.6	19.4	15.8	9.6	5.6	20.6	16.6	10.5	5.6	23.1	18.3	26	140	92	50	225	141
8	11.0	7.0	23.3	19.1	11.5	7.0	24.6	20.0	12.5	7.0	27.4	21.9	45	230	152	81	350	216
10	12.6	8.5	26.4	22.2	13.3	8.5	28.3	23.5	14.8	8.5	32.3	26.0	70	325	221	124	495	313
12	14.5	10.0	30.4	25.8	15.3	10.0	32.4	27.1	16.4	10.0	35.6	29.3	110	500	340	185	765	485
14	16.0	11.0	33.6	28.4	13.8	11.0	35.6	29.8	17.8	11.0	38.5	31.8	140	710	490	250	1025	665
16	17.1	12.0	35.6	30.4	17.9	12.0	37.9	32.0	19.3	12.0	41.8	34.5	180	860	580	295	1320	820
18	19.1	13.5	39.8	64.0	19.9	13.5	42.1	35.6	6.0	13.5	45.5	38.0	220	1025	725	395	1700	1060
20	20.8	15.0	43.3	37.4	21.5	15.0	45.4	38.9	22.8	15.0	49.3	41.5	285	1350	990	505	2250	1450
24	23.1	17.0	48.1	41.9	23.8	17.0	50.2	43.4	25.3	17.0	54.8	46.5	430	2100	1580	790	2340	2240
26																		
28																		
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For 900#, 1500# and 2500# dimensional information, contact Fil-Trek.
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CHART LEGEND

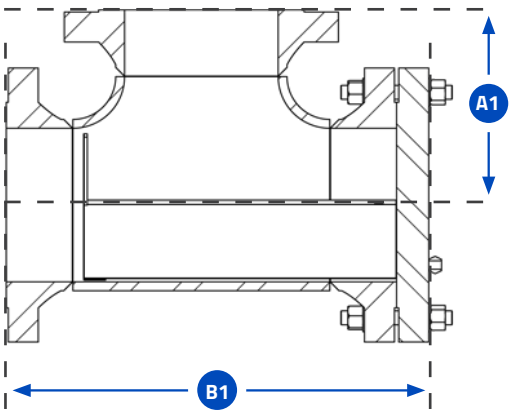
A1 Height - Flanged (center to top)

A2 Height - Butt Weld (center to top)

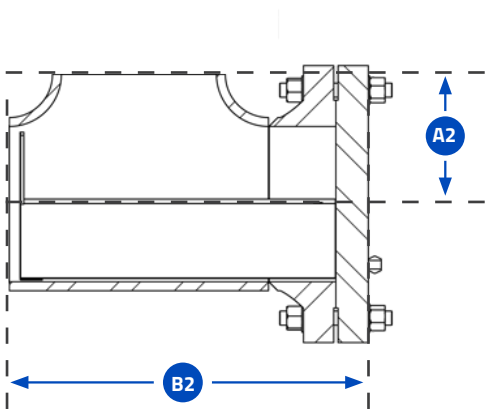
B1 Width - Flanged (face to face)

B2 Width - ButtWeld (face to face)

FLANGED



BUTT WELD



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MODEL DIMENSIONAL DETAILS

96D3A SERIES (90° SIDE TO TOP W/ SWING BOLT)

	150#				300#				600#				WT (LBS) 150#			WT (LBS) 300#		
SIZE	A1	A2	B1	B2	A1	A2	B1	B2	A1	A2	B1	B2	CVR	FLG	BW	CVR	FLG	BW
2																		
3																		
4																		
5																		
6																		
8																		
10																		
12																		
14																		
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18																		
20																		
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CHART LEGEND

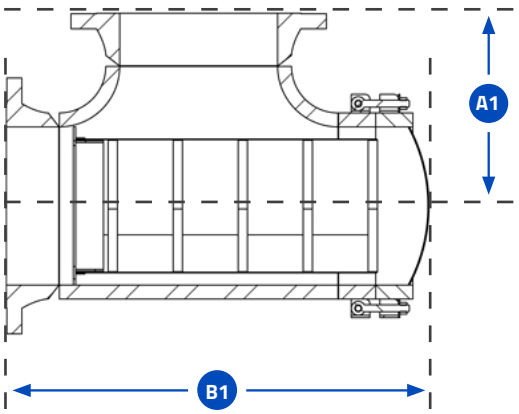
A1 Height - Flanged (center to top)

A2 Height - Butt Weld (center to top)

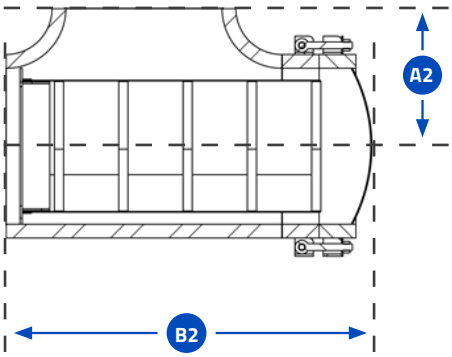
B1 Width - Flanged (face to face)

B2 Width - ButtWeld (face to face)

FLANGED



BUTT WELD



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MODEL DIMENSIONAL DETAILS

96D3B SERIES (90° SIDE TO TOP W/ THRU BOLT)

	150#				300#				600#				WT (LBS) 150#			WT (LBS) 300#		
SIZE	A1	A2	B1	B2	A1	A2	B1	B2	A1	A2	B1	B2	CVR	FLG	BW	CVR	FLG	BW
2	5.1	2.5	10.9	8.3	5.4	2.5	11.6	8.6	5.6	2.5	12.5	9.4	5	28	16	8	42	24
3	6.3	3.4	13.4	10.4	6.6	3.4	14.3	11.0	6.9	3.4	15.3	12.8	9	52	32	16	72	42
4	7.3	4.1	15.4	12.2	7.6	4.1	16.4	12.9	8.4	4.1	18.5	14.3	17	79	49	27	125	75
5	8.5	4.9	17.4	14.2	8.9	4.9	19.1	15.0	9.6	4.9	21.3	16.5	20	105	67	35	160	96
6	9.3	5.6	19.4	15.8	9.6	5.6	20.6	16.6	10.5	5.6	23.1	18.3	26	140	92	50	225	141
8	11.0	7.0	23.3	19.1	11.5	7.0	24.6	20.0	12.5	7.0	27.4	21.9	45	230	152	81	350	216
10	12.6	8.5	26.4	22.2	13.3	8.5	28.3	23.5	14.8	8.5	32.3	26.0	70	325	221	124	495	313
12	14.5	10.0	30.4	25.8	15.3	10.0	32.4	27.1	16.4	10.0	35.6	29.3	110	500	340	185	765	485
14	16.0	11.0	33.6	28.4	13.8	11.0	35.6	29.8	17.8	11.0	38.5	31.8	140	710	490	250	1025	665
16	17.1	12.0	35.6	30.4	17.9	12.0	37.9	32.0	19.3	12.0	41.8	34.5	180	860	580	295	1320	820
18	19.1	13.5	39.8	64.0	19.9	13.5	42.1	35.6	6.0	13.5	45.5	38.0	220	1025	725	395	1700	1060
20	20.8	15.0	43.3	37.4	21.5	15.0	45.4	38.9	22.8	15.0	49.3	41.5	285	1350	990	505	2250	1450
24	23.1	17.0	48.1	41.9	23.8	17.0	50.2	43.4	25.3	17.0	54.8	46.5	430	2100	1580	790	2340	2240
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CHART LEGEND

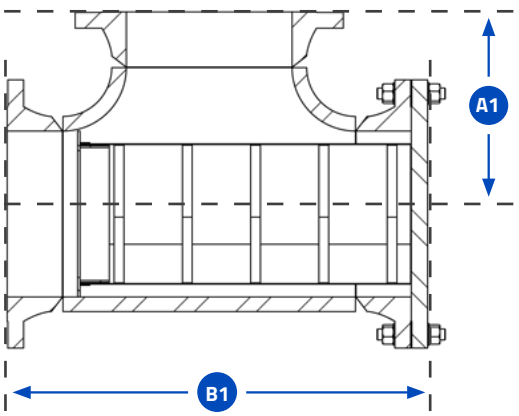
A1 Height - Flanged (center to top)

A2 Height - Butt Weld (center to top)

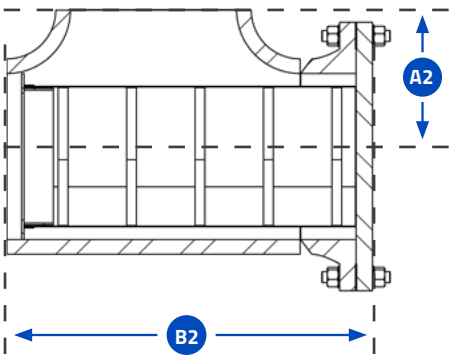
B1 Width - Flanged (face to face)

B2 Width - ButtWeld (face to face)

FLANGED



BUTT WELD



T Strainers

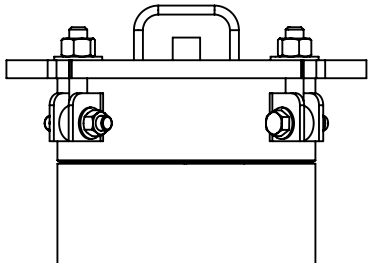
96 Series | Fabricated T Strainers

- Carbon or Stainless Steel
- Flanged or Buttweld
- Sizes from 2" to 36"

CLOSURE AND QUICK OPENING COVER OPTIONS

Fil-Trek designs and fabricates a variety of closure and quick opening cover options to accomodate strict applications and requirements. All materials of construction are in accordance with ASME specifications and manufacturing complies with the applicable rules of the ASME Code for Pressure Piping and with the ASME Boiler and Pressure Vessel Code.

HINGED COVER

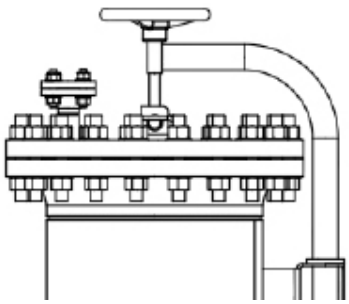


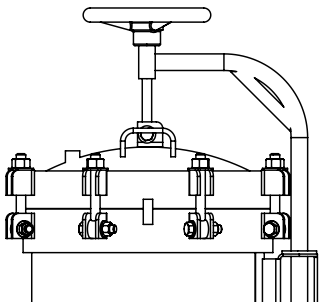
The most economical quick opening closure offered for fabricated strainers with nominal pressure applications. The swing bolt hinged cover uses an O-ring to seal. Easy to open by quickly and easily by loosening the swing bolts until they clear the holding lugs and swinging the head open on its hinge.

MECHANICAL DAVIT ASSEMBLY

Our mechanical davit assembly makes it easy for the operator to open and swing the cover away to facilitate basket or screen removal for cleaning. It is used primarily for larger strainers where cover removal is difficult and heavy. This is the most inexpensive alternative to quick release covers, especially when operating conditions require a bolted cover. Available for swing bolt and ANSI closures.

**Hydraulic davit head lift also available.





T Strainers

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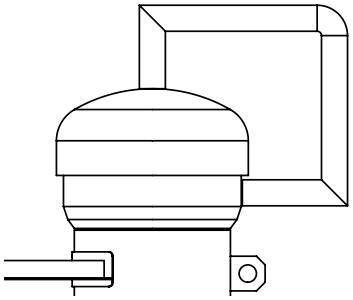
- Carbon or Stainless Steel
- Flanged or Buttweld
- Sizes from 2" to 36"

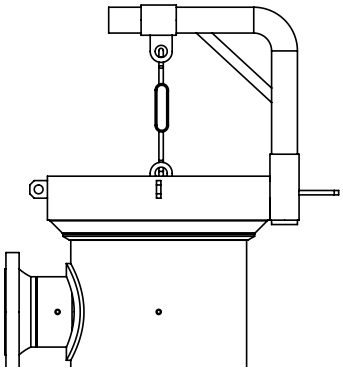
THREADED HINGED COVER



The quick open threaded hinged closure uses a cap fastened to a hub and is welded to the strainer body. The female cap is threaded onto the male hub using O-rings to seal. The O-ring prevents corrosion of the closure threads and provides a long, trouble free service. The threaded cover can be used for both nominal and high pressure applications. Available in both vertical and horizontal configurations.

YOKE CLOSURE

The Yoke hinged cover is a true ANSI rated closure and uses an O-ring seal. Used primarily on high pressure applications, it is available for 150#, 300#, 600#, 900# and 1500# ANSI ratings with a wide range of operating aids, ranging from a single lever chain and sprocket drive to completely automated.



CLOSURE COMPARISON

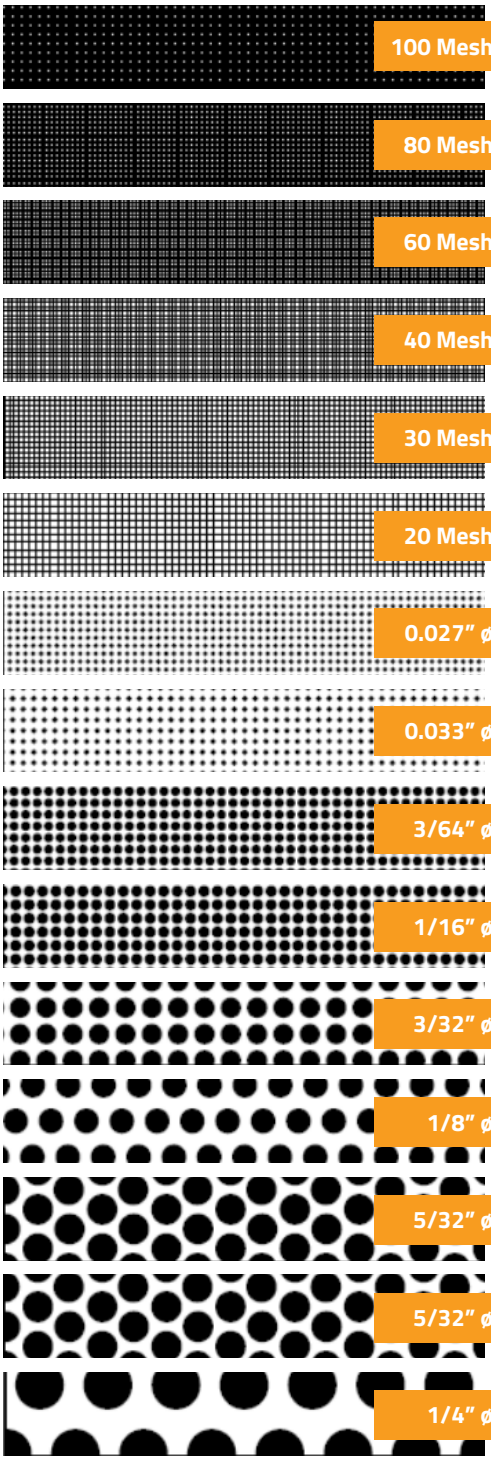
	COVER TYPE			
	HINGED COVER	MECHANICAL DAVIT	THREADED COVER	YOKE CLOSURE
COST	Low	Moderate	High	High
QUICK OPENING ABILITY	Good	Fair	Best	Best
LOW PRESSURE APPLICATIONS	X	X	-	-
NOMINAL PRESSURE APPLICATIONS	X	X	X	X
HIGH PRESSURE APPLICATIONS	-	X	X	X

T Strainers

96 Series | Fabricated T Strainers

- Carbon or Stainless Steel
- Flanged or Buttweld
- Sizes from 2" to 36"

SCREEN OPENINGS



100 Mesh	30% O.A. 0.006" Openings
80 Mesh	36% O.A. 0.008" Openings
60 Mesh	38% O.A. 0.010" Openings
40 Mesh	41% O.A. 0.016" Openings
30 Mesh	45% O.A. 0.022" Openings
20 Mesh	49% O.A. 0.035" Openings
0.027" ø	23% O.A.
0.033" ø	28% O.A.
3/64" ø	36% O.A.
1/16" ø	37% O.A.
3/32" ø	39% O.A.
1/8" ø	40% O.A.
5/32" ø	58% O.A.
5/32" ø	58% O.A.
1/4" ø	40% O.A.

FACTORS TO CONSIDER

1 Purpose

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

2 Service

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

3 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 screen.

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. are in inventory.

Screens are available in a wide range of materials. Screens of carbon steel, stainless steel (304, 316), alloy 20, monel 400, hastelloy C and titanium grade 2 are in inventory.

Custom manufactured screens are available upon request. Please consult factory.

T Strainers

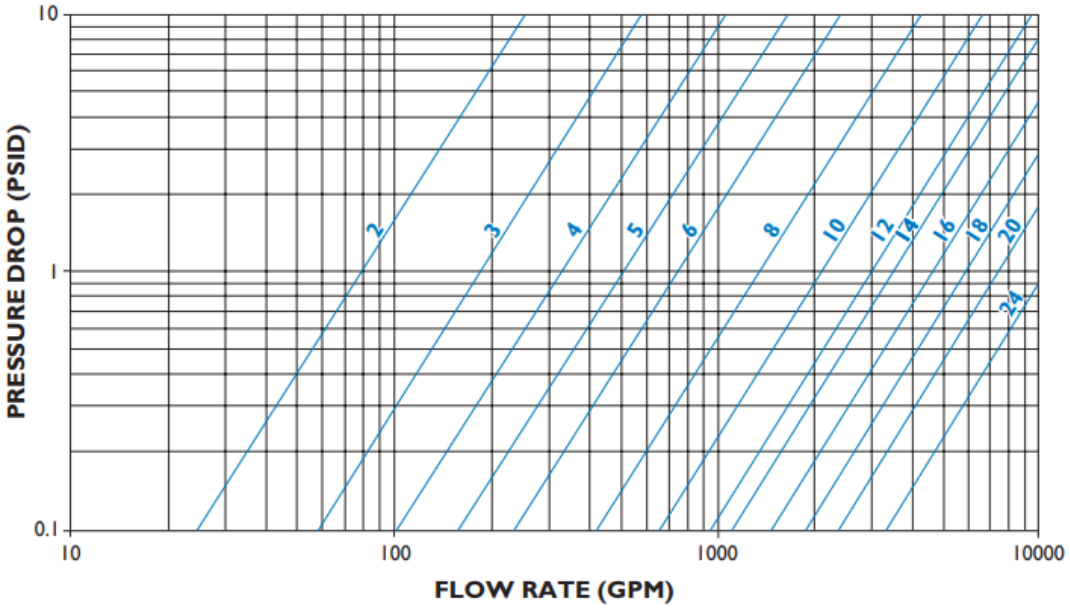
96 Series | Fabricated T Strainers

- Carbon or Stainless Steel
- Flanged or Buttweld
- Sizes from 2" to 36"

PRESSURE DROP | LIQUIDS

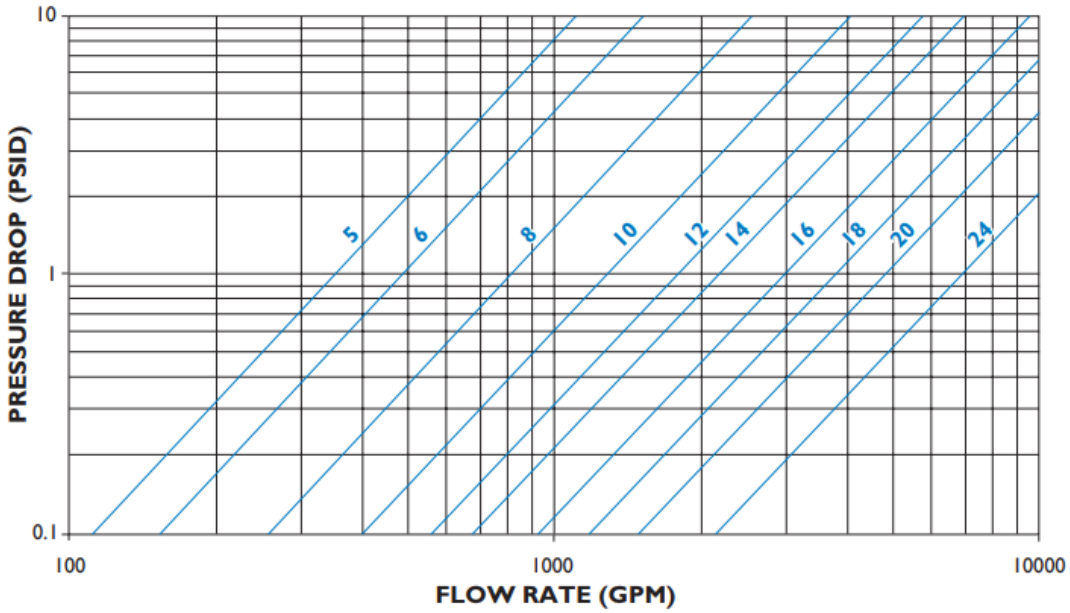
Fabricated Basket Strainers | 2" to 24"

Figure 1



Fabricated Duplex Basket Strainers | 5" to 24"

Figure 2



Notes:

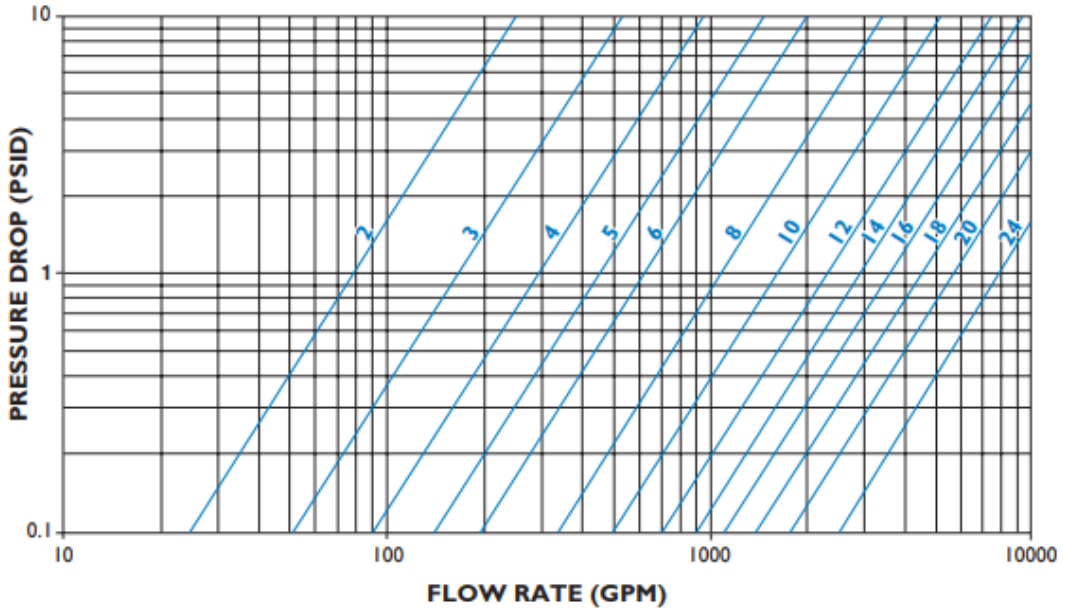
Pressure drop curves are based on water flow with standard screens.

See Chart # 1 for correction factors to be used with other fluids and/or screen openings.

PRESSURE DROP | LIQUIDS

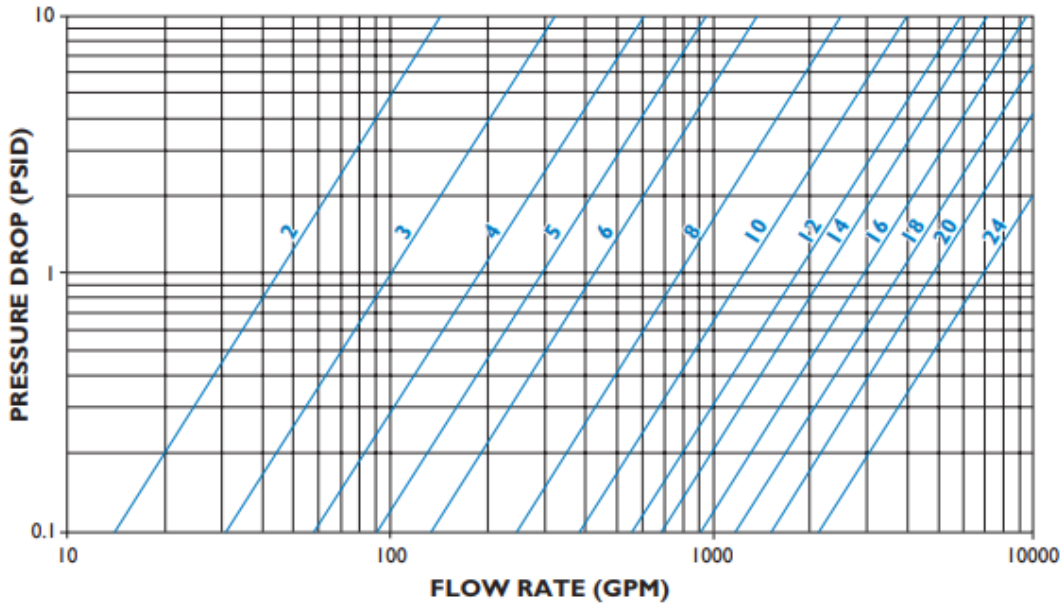
Fabricated T Strainers | 2" to 24"

Figure 3



Fabricated Y Strainers | 2" to 24"

Figure 4



Notes:

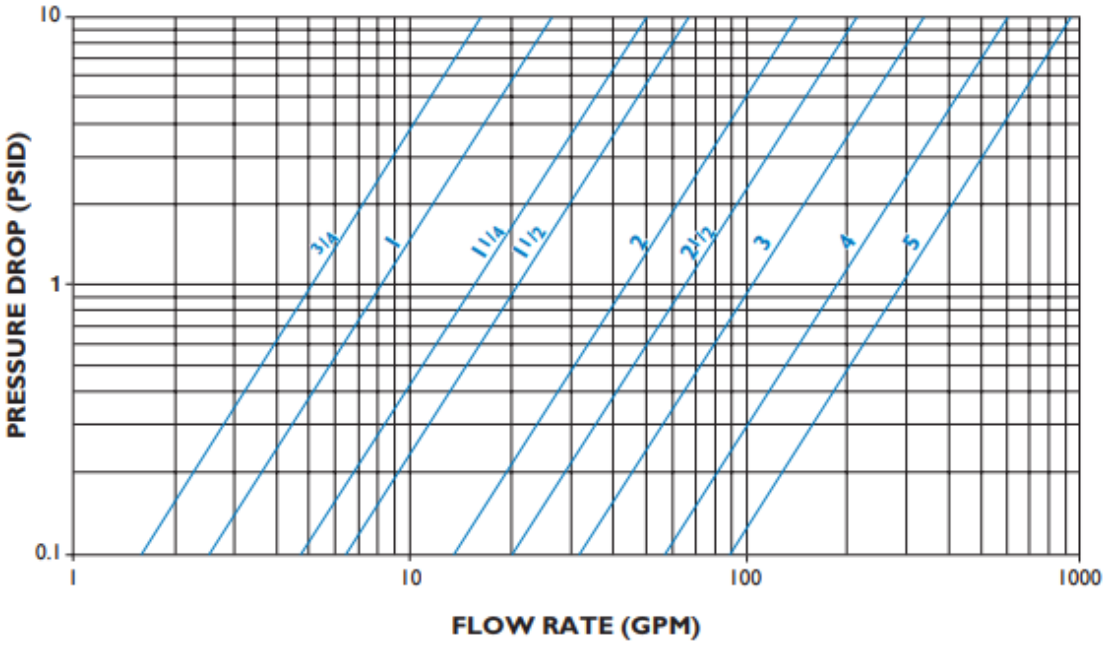
Pressure drop curves are based on water flow with standard screens.

See Chart # 1 for correction factors to be used with other fluids and/or screen openings.

PRESSURE DROP | LIQUIDS

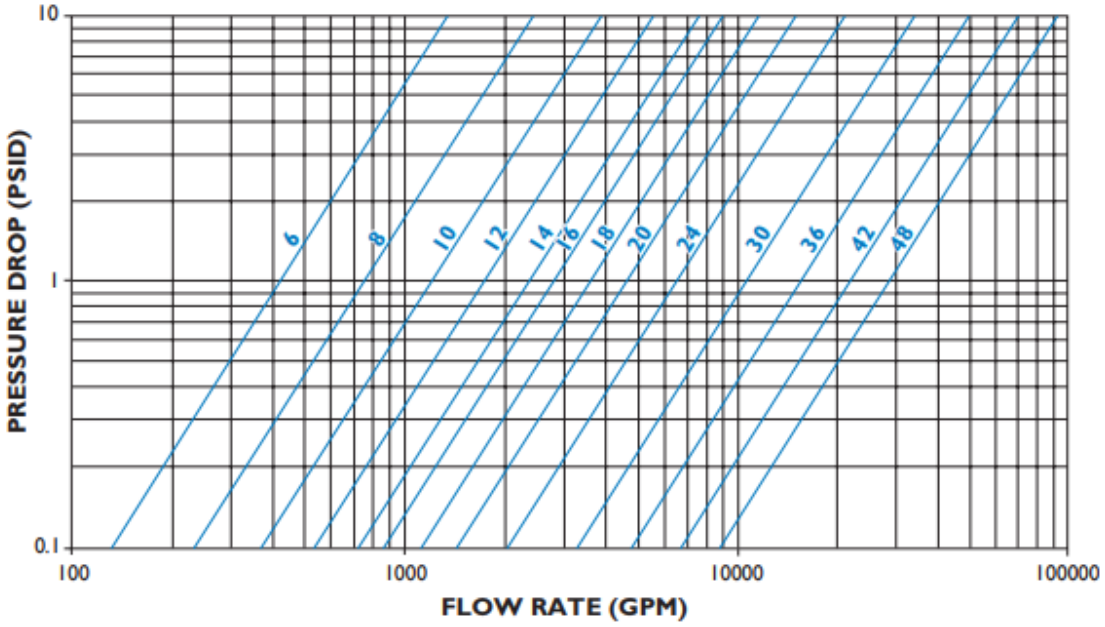
Temporary Strainers | 3/4" to 5"

Figure 5



Temporary Strainers | 6" to 48"

Figure 6



Notes:

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

See Chart # 1 for correction factors to be used with other fluids and/or screen openings.

T Strainers

96 Series | Fabricated T Strainers

- Carbon or Stainless Steel
- Flanged or Buttweld
- Sizes from 2" to 36"

SCREEN CORRECTION FACTOR CHART

Non-Standard and Mesh Lined Screens

Chart # 1

	PERF. PLATE % SCREEN MATERIAL OPEN AREA					MESH LINED SCREENS % SCREEN MATERIAL OPENING AREA		
SIZE RANGE	60%	50%	40%	30%	20%	50%	40%	30%
¼" to 1 ½"	0.45	0.55	0.70	1.00	1.15	1.05	1.05	1.20
2" to 48"	0.65	0.80	1.00	1.40	2.15	1.05	1.05	1.20

BASKET STRAINER EXAMPLE

Strainer Size:	10"
Screen Size:	100 Mesh, 1/8" Perf
Flow Rate:	3000 GPM
Service:	Water
Specific Gravity:	1
Viscosity:	100 cP

How To Calculate:	***RESULTS***
1) Use Figure 1 to get the pressure drop of the screen.	**2.0**
2) Refer to the Screen Opening chart to determine the % Open Area of the mesh/screen size being used.	**30%**
3) Using the chart above, find the correction factor to be used.	**1.20**
4) Multiply the PSID by the correction factor to determine the total pressure drop.	**2.4**
Example:	**2.0 x 1.2 = 2.4 PSID clean**

VISCOSITY & DENSITY CORRECTION FACTOR CHART

Chart # 2

SIZE RANGE	COMPONENT FACTOR (CF)
¾" to 1 ½"	0.25
2" to 48"	0.35

Chart # 3

		SCREEN LOSS FACTOR			
VISCOSITY (cP)	BODY LOSS FACTOR (BF)	PERF ONLY (PF)	20 MESH (MF)	30 to 40 MESH (MF)	60 to 300 MESH (MF)
10	1.0	1.15	1.20	1.40	1.50
25	1.2	1.25	2.00	2.20	2.50
100	1.6	1.40	3.00	4.00	6.50
200	2.2	1.50	4.50	7.00	11.50
500	4.4	1.60	10.00	15.00	25.00
1000	8.0	1.70	15.00	30.00	50.00
2000	15.0	1.90	30.00	60.00	100.00

How To Calculate:	***RESULTS***
1) Use the pressure drop (P1) through the strainer with water flow and standard or mesh screens from Chart # 1.	**2.4**
2) Multiply P1 by the specific gravity of the fluid actually flowing through the strainer to get P2.	**2.4**
3) Using Chart # 2 above, multiply P2 by the correct component factor to get P3.	**0.84**
4) Subtract P3 from P2 to equal P4.	**1.56**
5) Multiply P3 by the appropriate Body Loss factor from Chart # 3 above to get P5.	**1.34**
6) Multiply P4 by the appropriate Screen Loss factor from Chart # 3 above to get P6.	**10.14**
7) Total pressure drop will be P5 + P6 = P7.	**Total Pressure Drop = 11.48 PSID clean**

T Strainers

96 Series | Fabricated T Strainers

- Carbon or Stainless Steel
- Flanged or Buttweld
- Sizes from 2" to 36"

CORRECTION FACTORS

For Clogged Screens

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	3.90
30%	-	-	-	-	-	1.40	5.00
40%	-	-	-	-	-	1.80	6.65
50%	-	-	-	-	1.25	2.50	9.45
60%	-	-	-	1.15	1.80	3.70	14.50
70%	-	-	-	1.75	2.95	6.4	26.00
80%	-	1.10	1.75	3.60	6.25	14.00	58.00
90%	2.30	3.45	6.00	13.50	24.00	55.00	-

NOTES:

1. See Figures 7 to 10 for the ratio of free area to pipe area for Fil-Trek strainers equipped with standard screens.
2. For screens other than Fil-Trek 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. (see Figures 7 to 10)
OA = Open area of screen media, % (Screen Opening chart, i.e. 1/8" perf = 40%)
Ap = Nominal area of pipe fitting, sq. in. (see Figures 7 to 10)

STANDARD SCREEN EXAMPLE

T Strainer Size:	8"
Screen Size:	5/32" Perf
Flow Rate:	1000 GPM
Service:	Water
% Clogged:	60%

How To Calculate:	***RESULTS***
1) Find the pressure drop using Figure 3 .	**0.9**
2) Reference the ratio of free area to pipe area using Figure 9.	**1.3:1 (round down to 1:1)**
3) Using Chart # 4 above, find the correction factor based on the % clogged.	**3.9**
4) Calculate the total pressure drop by multiplying the pressure drop from step 1 with the correction factor from step 3.	**0.9 x 3.9 = 3.51 PSID**

NON STANDARD SCREEN EXAMPLE

T Strainer Size:	8"
Screen Size:	1/8" Perf
Flow Rate:	1000 GPM
Service:	Water
% Clogged:	20%

How To Calculate:	***RESULTS***
1) Find the pressure drop on page using Figure 3 with a standard screen size.	**0.9**
2) Using the Screen Correction chart to determine the % of open area (OA) of 5/32" perf.	**58%**
3) See Chart # 1 to find the correction factor for 5/32" perf (round up).	**0.65**
4) Multiply step 1 by the pressure drop from step 3.	**0.9 x 0.65 = 0.59 PSID**
5) SINCE a non-standard screen is being used, use the formula above to calculate the Ratio free area to pipe area (Ag = 167, OA = 58%, Ap = 50.3).	**1.9:1 (round up to 2:1)**
6) Using the result from step 5, check Chart # 4 to find the correction factor.	**3.7**
7) Multiply results from step 4 and step 6 to get the pressure drop when clogged.	**0.59 x 3.7 = 2.2 PSID**

T Strainers

96 Series | Fabricated T Strainers

- Carbon or Stainless Steel
- Flanged or Buttweld
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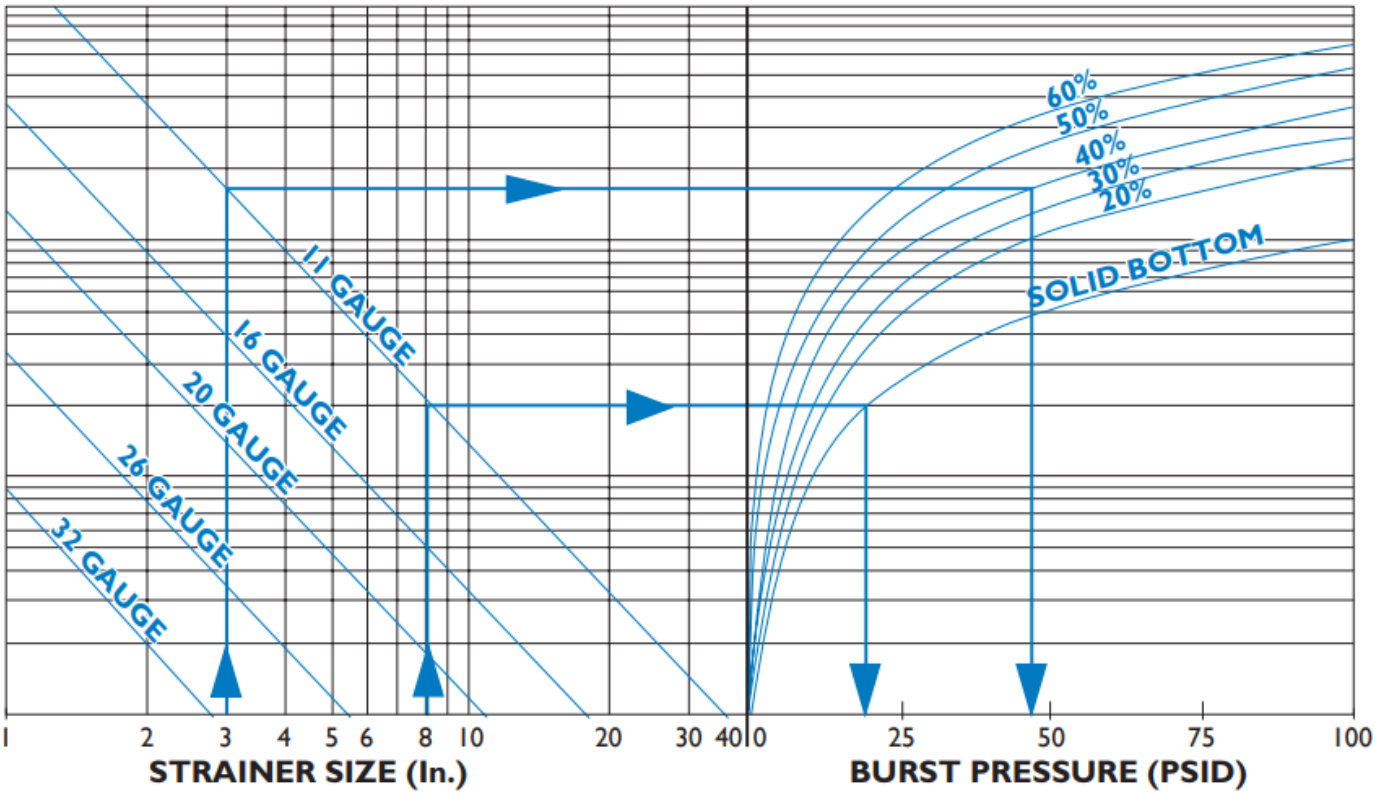
SCREEN BURST PRESSURE

Basket and Duplex Basket Strainers



NOTES:

1. The above chart is to be used for strainers manufactured from perforated plate and is based on the formula below
2. The above chart is based on standard dimensions. Higher burst pressure ratings are available. Please contact factory.
3. The above chart is based on a screen material of stainless steel. No safety factor is incorporated. It is the responsibility of the user to determine an acceptable safety factor.
4. See the Screen Openings chart for % Open Area's of standard perforated plate.

$$t = d\sqrt{\frac{0.3P}{S}}$$

t = Thickness of perforated plate, in.
d = Basket Diameter, in.
P = Burst Pressure, psi
S = Reduced allowable stress, psi

EXAMPLE 1

Strainer Size: 8"
Basket Type: Perf w/ 11 gauge solid bottom
Screen Mat'l
Open Area: 20% - 60%

EXAMPLE 2

Strainer Size: 3"
Basket Type: 11 gauge w/ 11 gauge bottom
Screen Mat'l
Open Area: 40%

How To Calculate:

- **A** Locate Strainer size.
- **B** Follow vertical line to gauge thickness.
- **C** Follow horizontal line to required perforation open area.
- **D** Follow vertical line downward to read burst pressure.
- **E** Burst pressure equals:
  19 psid for EXAMPLE 1 and **44 psid** for EXAMPLE 2

T Strainers

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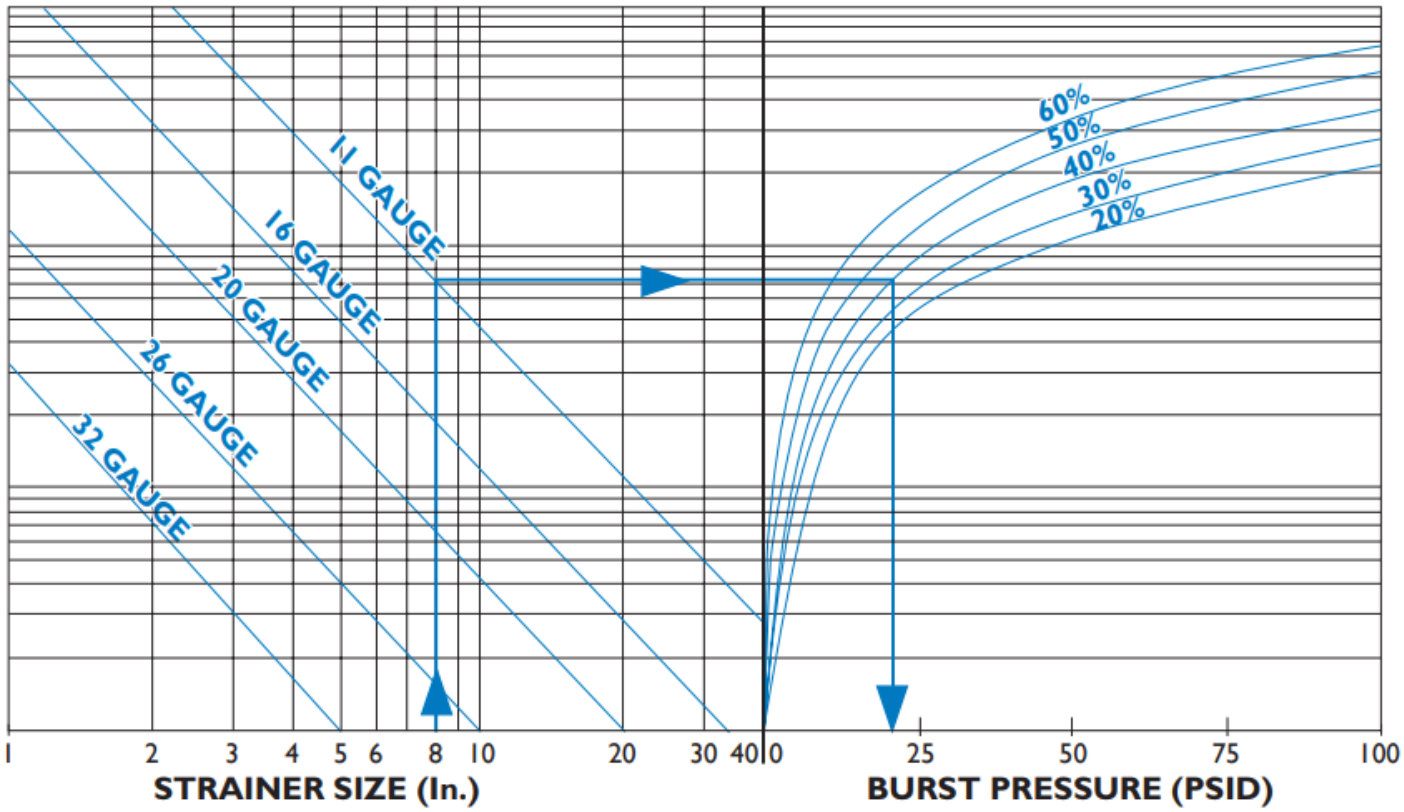
- Carbon or Stainless Steel
- Flanged or Buttweld
- Sizes from 2" to 36"

SCREEN BURST PRESSURE

T Strainers



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4. See the Screen Openings chart for % Open Area's of standard perforated plate.

$$t = d\sqrt{\frac{0.3P}{S}}$$

t = Thickness of perforated plate, in.
d = Basket Diameter, in.
P = Burst Pressure, psi
S = Reduced allowable stress, psi

EXAMPLE

Strainer Size:	8"
Basket Type:	11 gauge
Screen Mat'l Open Area:	40%

How To Calculate:

- **A** Locate Strainer size.
- **B** Follow vertical line to gauge thickness.
- **C** Follow horizontal line to required perforation open area.
- **D** Follow vertical line downward to read burst pressure.
- **E** Burst pressure equals **20 psid**.

T Strainers

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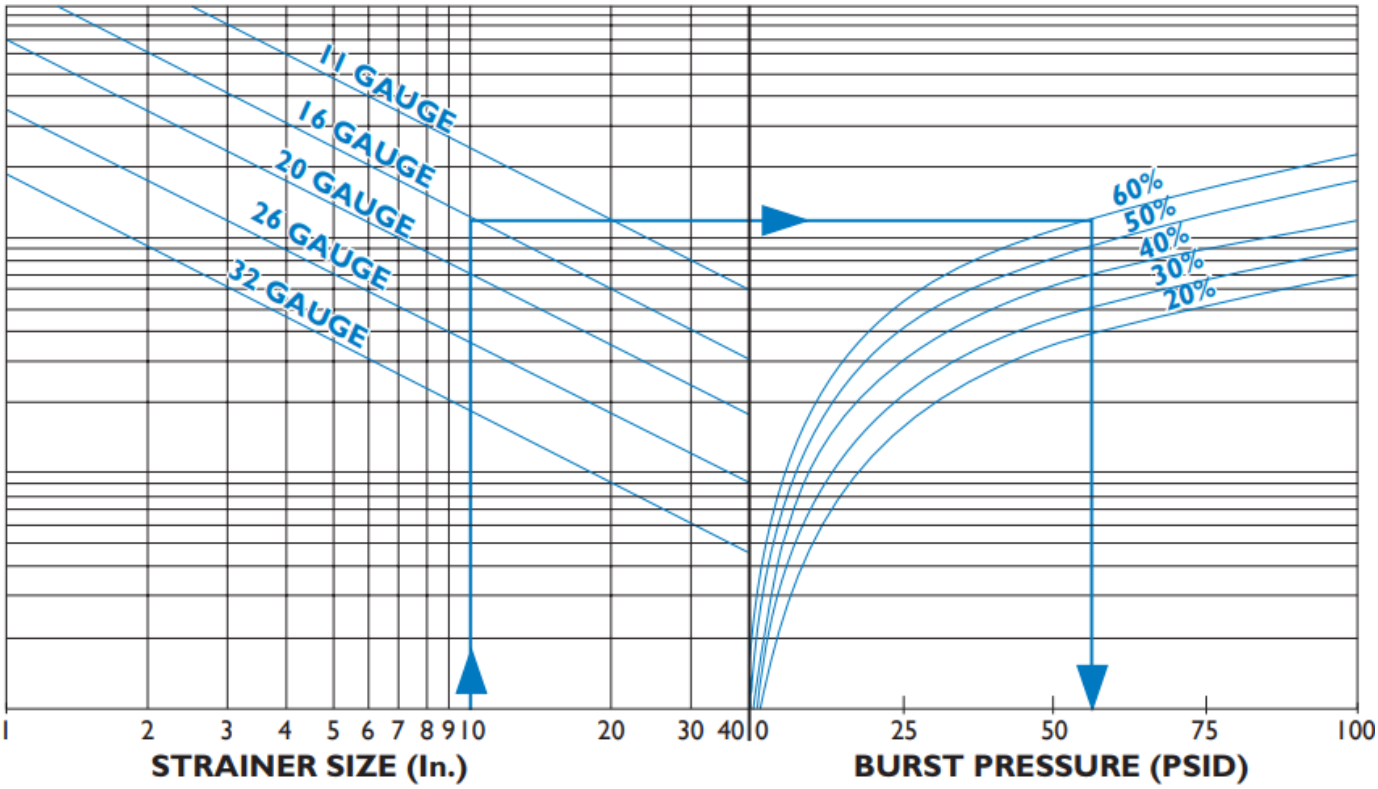
- Carbon or Stainless Steel
- Flanged or Buttweld
- Sizes from 2" to 36"

SCREEN BURST PRESSURE

Y Strainers



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3. The above chart is based on a screen material of stainless steel. No safety factor is incorporated. It is the responsibility of the user to determine an acceptable safety factor.
4. See the Screen Openings chart for % Open Area's of standard perforated plate.

$$P = \frac{St}{R - 0.4t}$$

P = Burst pressure, psi
S = Reduced allowable stress, psi
t = Thickness of perforared plate, in
R = Outside radius of screen, in

EXAMPLE

Strainer Size:	10"
Basket Type:	16 gauge
Screen Mat'l Open Area:	60%

How To Calculate:

- **A** Locate Strainer size.
- **B** Follow vertical line to gauge thickness.
- **C** Follow horizontal line to required perforation open area.
- **D** Follow vertical line downward to read burst pressure.
- **E** Burst pressure equals **56 psid**.

T Strainers

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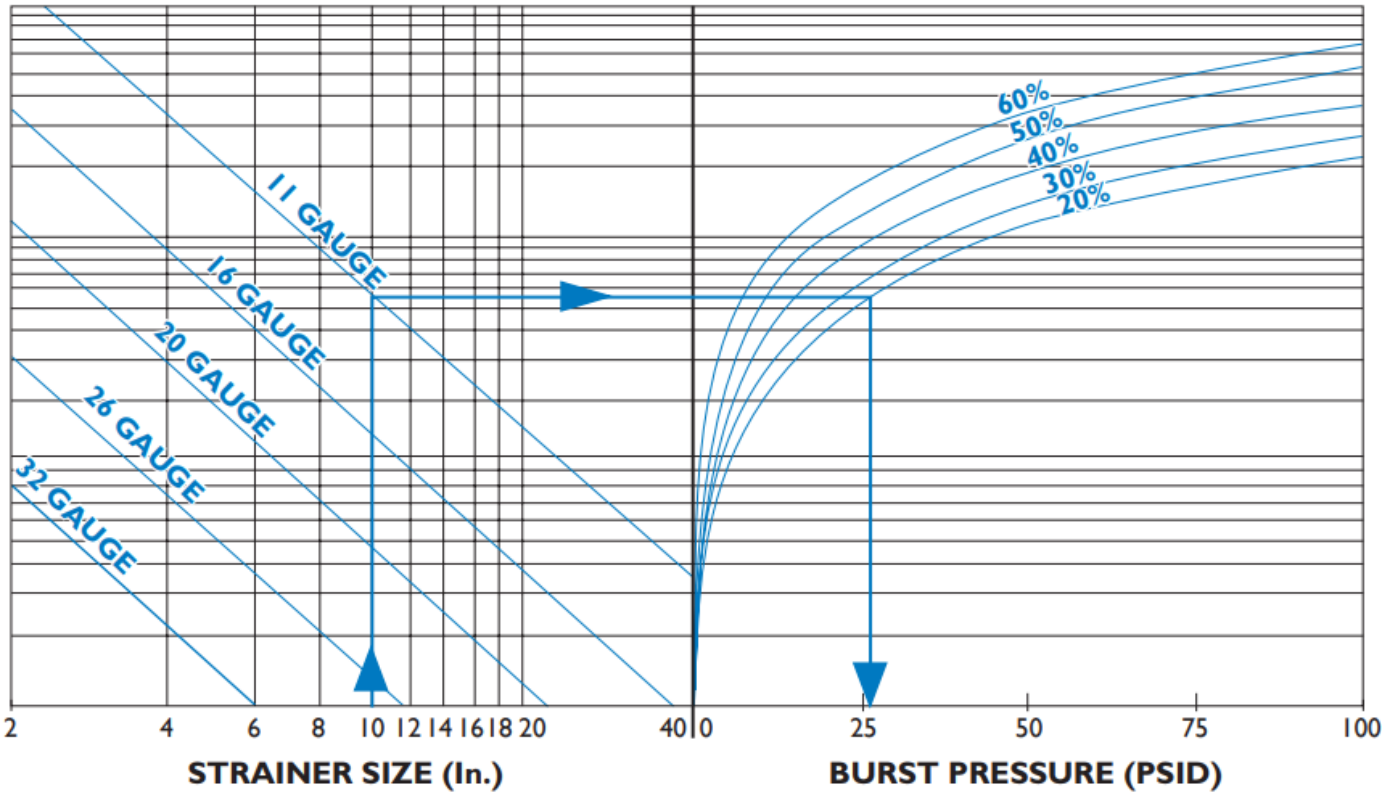
- Sizes from 2" to 36"

SCREEN BURST PRESSURE

Temporary Basket Strainers



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3. The above chart is based on a screen material of stainless steel. No safety factor is incorporated. It is the responsibility of the user to determine an acceptable safety factor.
4. See the Screen Openings chart for % Open Area's of standard perforated plate.

$$t = d\sqrt{\frac{0.3P}{S}}$$

t = Thickness of perforated plate, in.
d = Dimension B (see strainer sizing), in.
P = Burst Pressure, psi
S = Reduced allowable stress, psi

EXAMPLE

Strainer Size:	10"
Basket Type:	11 gauge
Screen Mat'l Open Area:	20%

How To Calculate:

- **A** Locate Strainer size.
- **B** Follow vertical line to gauge thickness.
- **C** Follow horizontal line to required perforation open area.
- **D** Follow vertical line downward to read burst pressure.
- **E** Burst pressure equals **27 psid**.

T Strainers

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- Carbon or Stainless Steel
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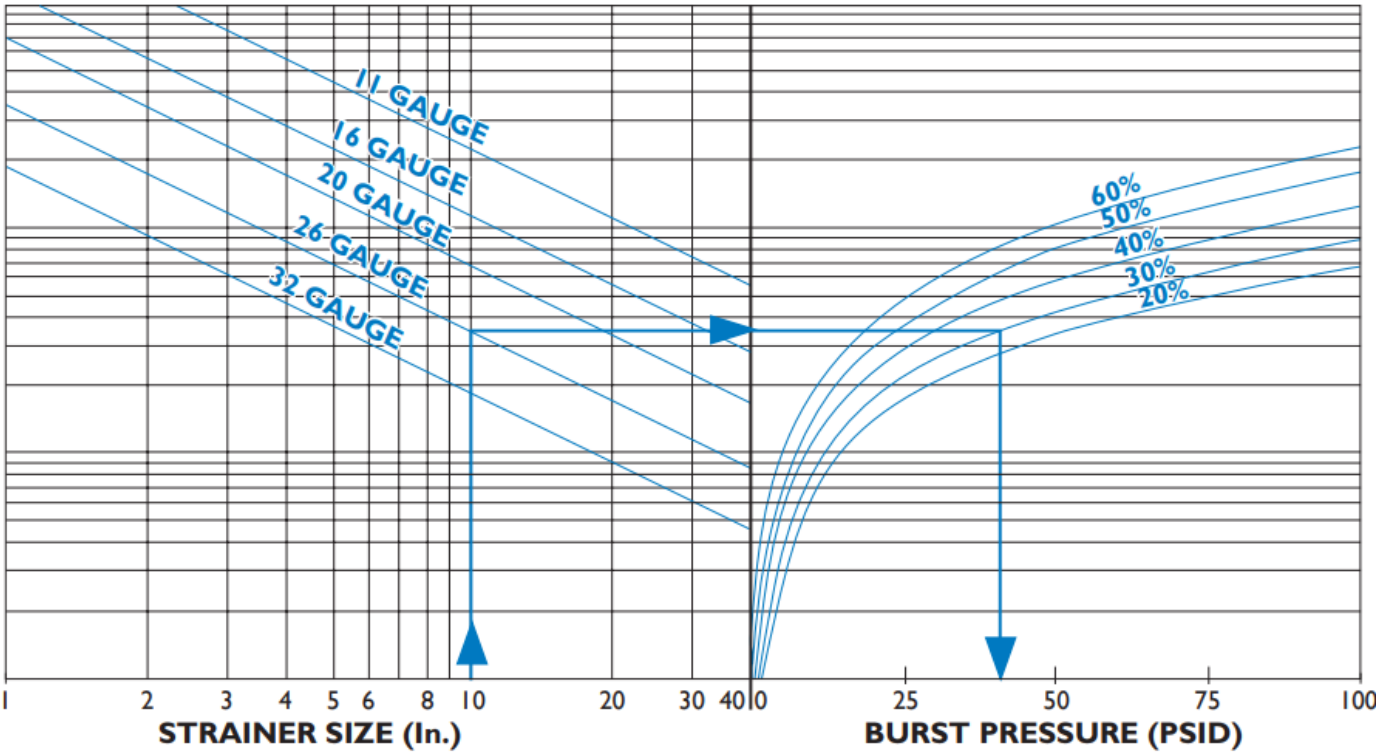
- Sizes from 2" to 36"

SCREEN BURST PRESSURE

Conical Strainers



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3. The above chart is based on a screen material of stainless steel. No safety factor is incorporated. It is the responsibility of the user to determine an acceptable safety factor.
4. See the Screen Openings chart for % Open Area's of standard perforated plate.

$$P = \frac{2St\cos\angle}{D + 1.2t\cos\angle}$$

t = Thickness of perforated plate, in.
d = Dimension B (see strainer sizing), in.
P = Burst Pressure, psi
S = Reduced allowable stress, psi
∠ = 15 degree

EXAMPLE

Strainer Size:	10"
Basket Type:	26 gauge
Screen Mat'l Open Area:	30%

How To Calculate:

- **A** Locate Strainer size.
- **B** Follow vertical line to gauge thickness.
- **C** Follow horizontal line to required perforation open area.
- **D** Follow vertical line downward to read burst pressure.
- **E** Burst pressure equals **41 psid**.

FIL-TREK

T96DS-11-18

FABRICATED STRAINER SCREEN EFFECTIVE AREAS

Basket Strainers | 2" to 24"

Figure 7

PIPE SIZE (IN)	PERF. DIAMETER (IN)	NOM. AREA OF SCH 40/STD. PIPE (IN^2)	GROSS SCREEN AREA (IN^2)	FREE AREA (IN^2)	RATIO FREE AREA TO PIPE AREA (OAR)
2	1/8"	3.36	215	86	25.6
3	1/8"	7.39	265	106	14.3
4	1/8"	12.73	265	106	8.3
5	1/8"	20.01	380	152	7.6
6	1/8"	28.89	560	224	7.8
8	1/8"	50.03	570	228	4.6
10	1/8"	78.85	910	364	4.6
12	1/8"	113.10	1300	520	4.6
14	3/16"	140.50	1600	640	4.6
16	3/16"	185.66	1830	732	3.9
18	3/16"	237.10	2290	916	3.9
20	3/16"	294.83	2800	1120	3.8
24	3/16"	429.13	4090	1636	3.8

Duplex Basket Strainers | 2" to 24"

Figure 8

PIPE SIZE (IN)	PERF. DIAMETER (IN)	NOM. AREA OF SCH 40/STD. PIPE (IN^2)	GROSS SCREEN AREA (IN^2)	FREE AREA (IN^2)	RATIO FREE AREA TO PIPE AREA (OAR)
2	1/8"	3.36	215	86	25.6
3	1/8"	7.39	265	106	14.3
4	1/8"	12.73	265	106	8.3
5	1/8"	20.01	380	152	7.6
6	1/8"	28.89	560	224	7.8
8	1/8"	50.03	570	228	4.6
10	1/8"	78.85	910	364	4.6
12	1/8"	113.10	1300	520	4.6
14	3/16"	140.50	1600	640	4.6
16	3/16"	185.66	1830	732	3.9
18	3/16"	237.10	2290	916	3.9
20	3/16"	294.83	2800	1120	3.8
24	3/16"	429.13	4090	1636	3.8

OAR = Free Screen Area / Inlet Area

Free Screen Area = Opening % x Gross Screen Area

Values shown are approximate. Consult factory for exact ratios.

FABRICATED STRAINER SCREEN EFFECTIVE AREAS

T Strainers | 2" to 24"

Figure 9

PIPE SIZE (IN)	PERF. DIAMETER (IN)	NOM. AREA OF SCH 40/STD. PIPE (IN^2)	GROSS SCREEN AREA (IN^2)	FREE AREA (IN^2)	RATIO FREE AREA TO PIPE AREA (OAR)
2	1/8"	3.36	22	9	2.6
3	1/8"	7.39	40	16	2.2
4	1/8"	12.73	58	23	1.8
5	1/8"	20.01	82	33	1.6
6	1/8"	28.89	105	42	1.5
8	1/8"	50.03	167	67	1.3
10	1/8"	78.85	235	94	1.2
12	1/8"	113.10	330	132	1.2
14	3/16"	140.50	420	168	1.2
16	3/16"	185.66	510	204	1.1
18	3/16"	237.1	640	256	1.1
20	3/16"	294.83	780	312	1.1
24	3/16"	429.13	1060	424	1.0

Y Basket Strainers | 2" to 24"

Figure 10

PIPE SIZE (IN)	PERF. DIAMETER (IN)	NOM. AREA OF SCH 40/STD. PIPE (IN^2)	GROSS SCREEN AREA (IN^2)	FREE AREA (IN^2)	RATIO FREE AREA TO PIPE AREA (OAR)
2	1/8"	3.36	39	16	4.6
3	1/8"	7.39	77	31	4.2
4	1/8"	12.73	135	54	4.2
5	1/8"	20.01	160	64	3.2
6	1/8"	28.89	215	86	3.0
8	1/8"	50.03	375	150	3.0
10	1/8"	78.85	545	218	2.8
12	1/8"	113.10	785	314	2.8
14	3/16"	140.50	900	360	2.6
16	3/16"	185.66	1210	484	2.6
18	3/16"	237.1	1560	625	2.6
20	3/16"	294.83	1950	780	2.6
24	3/16"	429.13	2765	1106	2.6

OAR = Free Screen Area / Inlet Area
Free Screen Area = Opening % x Gross Screen Area
Values shown are approximate. Consult factory for exact ratios.

T Strainers

96 Series | Fabricated T Strainers

- Carbon or Stainless Steel
- Flanged or Buttweld
- Sizes from 2" to 36"

INSTALLATION AND MAINTENANCE INSTRUCTIONS

Strainer installation instructions

- Ensure all machined surfaces are free of defects and that the inside of the strainer is free of foreign objects.
- For horizontal and vertical pipelines, the strainer should be installed so that the blow-down drain connection is pointed downward.
- For flanged end strainers, the flange bolting should be tightened gradually in a back and forth clockwise motion. Threaded end strainers should use an appropriate sealant.
- Once installed, increase line pressure gradually and check for leakage around joints.
- If the strainer is supplied with a start-up screen, monitor pressure drop carefully.

Screen removal instructions

- Drain piping
- Vent line to relieve pressure.
- Loosen cover and open to access screen.
- Remove, clean and replace screen in original position (Note: In some instances, a high pressure water jet or steam may be required for effective cleaning)
- Inspect cover gasket for damage. If necessary, replace. (Note: If spiral wound gaskets have been used, they must be replaced and can not be used again)
- Tighten cover. The strainer is ready for line startup.

CAUTION SHOULD BE TAKEN DUE TO POSSIBLE EMISSION OF PROCESS MATERIAL FROM PIPING. ALWAYS ENSURE NO LINE PRESSURE EXISTS WHEN OPENING COVER

Maintenance instructions

For maximum efficiency, determine the length of time it takes for the pressure drop to double that in the clean condition. Once the pressure drop reaches an unacceptable value, shut down line and follow the “Screen Removal Instructions” above. A pressure gauge installed before and after the strainer in-line will indicate pressure loss due to clogging and may be used to determine when cleaning is required.

Trouble shooting guides and diagnostic techniques

- After pressurizing, inspect cover and other joints for leakage. Gasket replacement or cover tightening is necessary if leakage occurs.
- If the required filtration is not taking place, ensure the screen is installed in the correct position, that being flush to the screen seating surfaces.

WARNING

This product operates in pipelines or with equipment that carries fluids and/or gasses at elevated temperatures and pressures. Caution should be taken to make sure that this equipment is installed correctly and inspected regularly. Caution should also be taken to protect personnel from fluid or gas leakage.

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