

INDUSTRIAL PLUMBING

Wil-loc[®]

REFERENCE GUIDE

ATMOSPHERIC PRESSURE RATINGS

FEET OF WATER TO INCHES OF MERCURY (BASED AT SEA LEVEL)

FT. OF WATER	IN. OF MERCURY	FT. OF WATER	IN. OF MERCURY
1	0.9	18	15.9
2	1.8	20	17.7
4	3.5	22	19.4
6	5.3	24	21.2
8	7.1	26	23.0
10	8.8	28	24.8
12	10.6	30	26.5
14	12.4	32	28.3
16	14.1	34	30.0

SUCTION LIFTS

ALTITUDE ABOVE SEA LEVEL	BAROMETRIC INCHES OF MERCURY	PRESSURE LBS. PER SQ. INCH	EQUIVALENT HEAD OF WATER (FT)	PRACTICAL SUCTION LIFT OF PUMP*
Sea Level	30.00	14.70	33.95	22.00
500 ft.	29.43	14.40	33.26	21.50
750 ft.	29.14	14.30	32.93	21.30
1000 ft.	28.88	14.20	32.63	21.00
1250 ft.	28.60	14.00	32.32	20.70
1500 ft.	28.33	13.90	32.01	20.50
1750 ft.	28.07	13.80	31.72	20.30
2000 ft.	27.81	13.60	31.42	20.00
3000 ft.	26.77	13.20	30.25	19.00
4000 ft.	25.76	12.60	29.11	18.00

* Practical lift is equal to the vertical distance to which water is to be lifted plus friction head and any other losses.

CONVERSIONS

TEMPERATURE

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times .556$$

$$^{\circ}\text{F} = (1.80 \times ^{\circ}\text{C}) + 32$$

LENGTH

$$1 \text{ in} = \text{mm} \times 25.4$$

$$1 \text{ mm} = 1 \text{ in} \div 25.4$$

$$1 \text{ m} = 100 \text{ cm} = 1000 \text{ mm}$$

$$1 \text{ m} = 3.28 \text{ ft} = 39.37 \text{ in}$$

$$1 \text{ yd} = 3 \text{ ft} = 36 \text{ in}$$

$$1 \text{ mi} = 5,280 \text{ ft}$$

$$1 \text{ mi} = 1.609 \text{ km}$$

WEIGHT

$$1 \text{ US gal} = 8.33 \text{ lbs}$$

$$1 \text{ ft}^3 \text{ of water} = 62.35 \text{ lbs}$$

$$1 \text{ kg} / \text{L of water} = 2.2 \text{ lbs}$$

$$1 \text{ US gal} = 3.7854 \text{ L}$$

VOLUME

$$1 \text{ ft}^3 \text{ of water} = 7.48 \text{ gal}$$

$$1 \text{ m}^3 = 35.314 \text{ ft}^3$$

$$1 \text{ acre ft} = 43,314 \text{ ft}^3$$

$$1 \text{ acre in} = 3,630 \text{ ft}^3$$

$$1 \text{ US gal} = 231 \text{ in}^3 \text{ or } 0.137 \text{ ft}^3$$

$$1 \text{ L} = 0.2642 \text{ US gal}$$

$$1 \text{ ft}^3/\text{s} = 448.8 \text{ GPM}$$

AREA

$$1 \text{ acre} = 43,560 \text{ ft}^2$$

$$1 \text{ ft}^2 = 144 \text{ in}^2$$

$$1 \text{ in}^2 = 64.516 \text{ mm}^2$$

$$1 \text{ m}^2 = 10.7639 \text{ ft}^2$$

ATMOSPHERIC

$$1 \text{ PSI} = 2.31 \text{ ft of water (head)}$$

$$1 \text{ ft of water} = 0.433 \text{ PSI}$$

$$1 \text{ in of Hg} = 0.491 \text{ PSI} / 1.134 \text{ ft. of water}$$

$$1 \text{ atmosphere at sea level} = 14.70 \text{ PSI} / 33.93 \text{ ft. of water}$$

$$\text{ft of Head} = \text{PSI} \times 2.309$$

$$\text{in of Hg} = \text{PSI} \times 2.036$$

$$\text{PSI} = \text{ft of head} \div 2.31$$

FORMULAS

AREA

$$\text{rectangle} = L \times W$$

$$\text{circle} = \pi r^2$$

$$\text{square} = s^2$$

$$\pi = 3.1416$$

VOLUME

$$\text{cube} = s^3$$

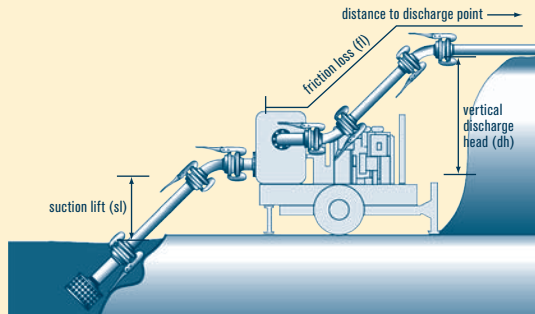
$$\text{rectangle prism} = L \times W \times H$$

$$\text{cylinder} = \pi r^2 H$$

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TOTAL DYNAMIC HEAD (TDH)

LOSS OF HEAD IN 100 LINEAR FEET OF PIPE



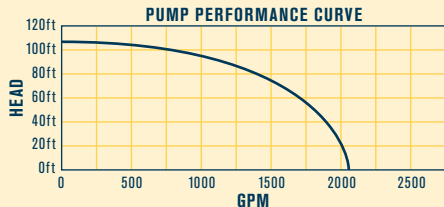
TOTAL DYNAMIC HEAD (TDH) = SUCTION LIFTS (SL) + VERTICAL DISCHARGE (DH) + FRICTION LOSS (FL)

If SL = 10' and DH = 60'

Then 10' + 60' = 70' of head, which corresponds with 1500 gpm

Now Using the FL table, 1500 gpm through 100' of 6" discharge pipe adds 17.0' to your Total Head due to friction inside the discharge pipe.

10' (SL) + 60' (DH) + 17.0' (FL) = 87' TDH
So Checking the performance curve at 87' TDH, you are moving approximately 1250 gpm at the open discharge.



GAL/ MIN.	NOMINAL DIAMETER OF STANDARD PIPE IN INCHES														
	1	1.25	1.5	2	2.5	3	3.5	4	5	6	8	10	12		
10	8.4	2.4	1.1	0.32											
15	18.0	4.8	2.2	0.65	0.28										
20	30.0	8.0	3.7	1.10	0.47	0.16									
30		17.0	8.0	2.30	1.00	0.34	0.17	0.09							
40			29.0	13.5	3.9	1.7	0.58	0.29	0.16						
50				21.0	5.8	2.6	0.88	0.44	0.24	0.08					
75					12.5	5.4	1.85	0.93	0.51	0.17	0.07				
100					21.0	9.3	3.1	1.6	0.85	0.28	0.12				
150						19.5	6.5	3.3	1.8	0.58	0.25	0.07			
200						33.0	11.3	5.8	3.1	1.03	0.42	0.11	0.04		
250							17.0	8.5	4.6	1.53	0.63	0.17	0.06		
300							24.0	12.2	6.6	2.1	0.87	0.24	0.08		
350								16.0	8.5	2.8	1.3	0.31	0.1	0.04	
400								21.0	11.0	3.6	1.5	0.39	0.13	0.06	
500									17.0	5.3	2.3	0.58	0.19	0.08	
600									23.0	7.4	3.1	0.82	0.27	0.11	
800										13.0	5.2	1.4	0.47	0.19	
1000										20.0	8.0	2.1	0.71	0.29	
1200											11.5	3.0	1.0	0.42	
1500											17.0	4.5	1.5	0.62	
2000												7.7	2.6	1.05	
2500													12.0	3.9	1.6
3000													16.8	5.5	2.3
4000														9.3	3.9

TOTAL DYNAMIC HEAD (TDH)

LOSS OF HEAD IN 100 LINEAR FEET OF PIPE

HDPE GENERAL EXPANSION / CONTRACTION

HDPE WEIGHT CHART (POUNDS/FOOT)

EXPANSION/CONTRACTION: 1" Expansion / Contraction on 100' of Pipe for every + or - 10°F from base temperature of 73.4°F.

TEMPERATURE: The pressure capabilities of polyethylene materials are re-rated for operating temperatures other than 73.4°F.

BASIC TEMPERATURE RE-RATING	
TEMPERATURE °F	PRESSURE RATING FACTOR
50	1.14
73.4	1.00
100	0.79
140	0.50

PSI RATINGS / STANDARD DIMENSIONS RATIO (SDR) + TEMPERATURE										
TEMP. °F	SDR 32.5	SDR 26	SDR 21	SDR 19	SDR 17	SDR 15.5	SDR 13.5	SDR 11	SDR 9	SDR 7
50	58	73	90	100	113	125	145	180	215	303
60	55	69	86	96	108	119	138	170	207	288
73.4	51	64	80	90	100	110	128	160	190	267
80	48	60	76	85	95	105	122	150	182	253
90	44	56	70	77	87	96	111	140	167	232
100	40	50	63	70	79	87	101	125	150	210
110	36	45	57	69	71	78	90	113	135	299
120	32	40	50	56	63	69	80	100	120	167
130	28	36	45	50	56	62	72	90	108	150
140	25	32	40	45	50	55	64	80	96	133

SIZE	SDR 7	SDR 9	SDR 11	SDR 13.5	SDR 15.5	SDR 17	SDR 19	SDR 21	SDR 26	SDR 32.5
2"	0.94	0.76	0.64	0.53	0.47	0.43				
3"	2.05	1.66	1.39	1.15	1.02	0.93	0.84	0.77	0.62	0.50
4"	3.39	2.74	2.29	1.90	1.68	1.54	1.39	1.26	1.03	0.83
6"	7.33	5.93	4.97	4.13	3.63	3.34	3.01	2.73	2.23	1.80
8"	12.43	10.05	8.42	7.00	6.16	5.65	5.10	4.64	3.79	3.05
10"	19.32	15.61	13.09	10.87	9.58	8.78	7.92	7.21	5.87	4.75
12"	27.16	21.97	18.41	15.29	13.48	12.36	11.14	10.13	8.26	6.67
14"	32.76	26.50	22.20	18.44	16.24	14.91	13.43	12.22	9.96	8.05
16"		34.60	29.00	24.09	21.21	19.46	17.54	15.96	13.01	10.50
18"		43.79	36.69	30.48	26.84	24.54	22.19	20.19	16.47	13.30
20"		54.05	45.30	37.63	33.14	30.41	27.42	24.93	20.34	16.41
24"		77.85	65.24	54.21	47.72	43.81	39.46	35.91	29.30	23.62
28"			88.78	73.78	64.95	58.62	53.73	48.86	39.88	32.19

HDPE GENERAL EXPANSION / CONTRACTION

HDPE WEIGHT CHART (POUNDS/FOOT)

HDPE EXTRA HIGH MOLECULAR WEIGHT PE3408 POLY PIPE

HDPE EXTRA HIGH MOLECULAR WEIGHT PE3408 POLY PIPE

Pressure (WPR) Rating	SDR 7		SDR 9		SDR 11		SDR 13.5		
	265 psi	200 psi	160 psi	130 psi					
WPR + Surge	400 psi		300 psi		192 psi		240 psi		
NOMINAL PIPE SIZE	O.D. (INCHES)	MIN. WALL	ID AVG	MIN. WALL	ID AVG	MIN. WALL	ID AVG	MIN. WALL	ID AVG
2	2.375	0.325	1.686	0.264	1.815	0.216	1.917	0.176	2.002
3	3.500	0.479	2.485	0.389	2.675	0.318	2.826	0.259	2.951
4	4.500	0.616	3.194	0.5	3.44	0.409	3.633	0.333	3.794
5 3/8	5.375	-	-	-	-	-	-	-	-
5	5.563	0.762	3.948	0.618	4.253	0.506	4.49	0.412	4.69
6	6.625	0.908	4.7	0.736	5.065	0.602	5.349	0.491	5.584
7 1/8	7.125	-	-	-	-	-	-	-	-
8	8.625	1.182	6.119	0.958	6.594	0.784	6.963	0.639	7.27
10	10.750	1.473	7.627	1.194	9.746	0.977	8.679	0.796	9.062
12	12.750	1.747	9.046	1.417	9.746	1.159	10.293	0.944	10.749
13	13.375	-	-	-	-	-	-	-	-
14	14.000	1.918	9.934	1.556	10.701	1.273	11.301	1.037	11.802
16	16.000	2.192	11.353	1.778	12.231	1.455	12.915	1.185	13.488
18	18.000	2.466	12.772	2.000	13.76	1.636	14.532	1.333	15.174
20	20.000	2.740	14.191	2.222	15.289	1.818	16.146	1.481	16.86
22	22.000	-	-	-	-	2.000	17.76	1.63	18.544
24	24.000	-	-	-	-	2.182	19.374	1.778	20.231
28	28.000	-	-	-	-	-	2.074	23.603	-
30	30.000	-	-	-	-	-	-	-	-
32	32.000	-	-	-	-	-	-	-	-
36	36.000	-	-	-	-	-	-	-	-
42	42.000	-	-	-	-	-	-	-	-
48	48.000	-	-	-	-	-	-	-	-
52	52.000	-	-	-	-	-	-	-	-
45	54.000	-	-	-	-	-	-	-	-

Pressures based on water at 73°F and determined by standard formulas for the industry.

SDR 15.5		SDR 17		SDR 21		SDR 26		SDR 32.5	
110 psi	100 psi	80 psi	65 psi	50 psi					
165 psi	150 psi	120 psi	96 psi	76 psi					
MIN. WALL	ID AVG	MIN. WALL	ID AVG	MIN. WALL	ID AVG	MIN. WALL	ID AVG	MIN. WALL	ID AVG
0.153	2.051	0.14	2.078	-	-	-	-	-	-
0.226	3.021	0.206	3.063	-	-	-	-	-	-
0.29	3.885	0.265	3.938	0.214	4.046	-	-	-	-
-	-	-	-	-	-	-	-	-	-
0.359	4.802	0.327	4.87	0.265	5.001	0.214	5.109	-	-
0.427	5.72	0.39	5.798	0.315	5.957	0.255	6.084	0.204	6.193
-	-	-	-	-	-	-	-	-	-
0.556	7.446	0.507	7.55	0.411	7.754	0.332	7.921	0.265	8.063
0.694	9.279	0.632	9.41	0.512	9.665	0.413	9.874	0.331	10.048
0.823	11.005	0.75	11.16	0.607	11.463	0.49	11.711	0.392	11.919
-	-	-	-	-	-	-	-	-	-
0.903	12.086	0.824	12.253	0.667	12.586	0.538	12.859	0.431	13.086
1.032	13.812	0.941	14.005	0.762	14.385	0.615	14.696	0.492	14.957
1.161	15.539	1.059	15.755	0.857	16.183	0.692	16.533	0.554	16.826
1.29	17.265	1.176	17.507	0.952	17.982	0.769	18.37	0.615	18.696
1.419	18.992	1.294	19.257	1.048	19.778	0.846	20.206	0.677	20.565
1.548	20.718	1.412	21.007	1.143	21.577	0.923	22.043	0.738	22.435
1.806	24.171	1.647	24.508	1.333	25.174	1.077	25.717	0.862	26.173
1.935	25.898	1.765	26.258	1.429	26.971	1.154	27.554	0.923	28.043
2.065	27.622	1.882	28.01	1.524	28.769	1.231	29.39	0.985	29.912
-	-	2.118	31.51	1.714	32.366	1.385	33.064	1.108	33.651
-	-	-	-	2.000	37.76	1.615	38.576	1.292	39.261
-	-	-	-	2.286	43.154	1.846	44.086	1.477	44.869
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	2.077	49.597	1.662	50.477

Average (AVG) inside diameter calculated on minimum wall plus 6%.

HDPE EXTRA HIGH MOLECULAR WEIGHT PE3408 POLY PIPE

HDPE EXTRA HIGH MOLECULAR WEIGHT PE3408 POLY PIPE

HDPE - VACUUM / EXTERNAL FLUID

FRICITION LOSS IN VARIOUS PIPE MATERIALS

When subjected to a vacuum, a sufficiently heavy wall pipe must be selected to resist the collapsing forces. Basically, the pipe's SDR governs the amount of vacuum a pipeline can support on a short-term or long-term basis. Thin-wall HDPE can sustain a full vacuum for a short time or a partial vacuum for a longer time. If, by accident, a thin-wall pipe were to be collapsed, such a collapse is not catastrophic for HDPE. It can be totally collapsed and then returned to its original roundness without damage by applying internal pressure for a short time.

Differential - Pressure (vacuum or external) capability for unsupported pipe at 73°F.

		PSI - PIPE SDR									
SERVICE LIFE	UNITS	7	9	11	15.5	17	19	21	26	32.5	
1 Day	psi	189	146	87	36	28	21	16	8	4	
	ft H2O	437	337	202	83	65	48	36	18	10	
	in Hg	386	298	178	73	57	42	32	16	9	
1 Month	psi	108	83	64	24	15	12	11	4	2	
	ft H2O	249	192	147	54	34	28	25	10	6	
	in Hg	220	170	130	48	30	25	22	9	5	
1 Year	psi	100	78	48	22	14	9	8	4	2	
	ft H2O	232	180	11	50	32	23	19	10	5	
	in Hg	205	159	98	44	28	19	17	9	4	
50 Years	psi	88	69	42	19	13	10	7	4	2	
	ft H2O	204	159	97	44	29	22	17	9	4	
	in Hg	180	140	86	39	26	20	15	8	4	

NOTE:

Based on critical collapse testing of actual pipe samples.
Full Vacuum is 14.7 psi, 34 ft water, 30 in Hg.

MULTIPLIERS FOR TEMPERATURE RE-RATING			
50°F (10°C)	73.4°F (23°C)	100°F (38°C)	120°F (49°C)
1.14	1.00	0.79	0.62

C RANGE	GALVANIZED STEEL	HDPE (POLYETHYLENE)	ALUMINUM
High	150	150	150
Low	120	140	130
New	140	150	
Design	130	140	

NOTE:

- Values shown are used in the Hazen-Williams equation for flow in pipes.
- Feet of Head Loss are subject to the following conditions:
 - Pipes carrying clear water at approximately 60°F.
 - Pipes are flowing full.
 - Velocities of water are generally less than 10 ft/s.

See subsequent tables for specific friction loss calculations.

MAXIMUM QUANTITIES OF WATER THROUGH PIPE								
PIPE SIZE PRESSURE (PSI)	GALLONS PER MINUTE							
	2	2.5	3	4	6	8	10	12
12 lbs.	106	200	290	589	1,595	3,239	6,050	8,773
30 lbs.	160	308	436	885	2,398	4,867	9,317	13,189
40 lbs.	184	350	504	1,023	2,772	5,626	10,587	15,246
50 lbs.	206	390	564	1,143	3,102	6,286	11,797	17,061
60 lbs.	226	430	617	1,252	3,393	6,886	13,007	18,661
75 lbs.	253	480	690	1,400	3,795	7,700	14,520	20,872
100 lbs.	292	558	797	1,607	4,383	8,838	16,879	24,106

Maximum quantities of water which maybe pumped through 100 feet of wrought iron pipe at various pressures.

NOTE:

- Double the pressure: ~1.41 times the volume.
- Double the diameter: ~5.55 times the volume.
- Double the diameter: Area Increases 4 times.
- Double the circumference: Increases 2 times.

FRICION LOSS IN VARIOUS PIPE MATERIALS (C=120)

FRICION LOSS IN VARIOUS PIPE MATERIALS (C=130)

FLOW (GPM)	3"	4"	5"	6"	8"	10"	12"
5							
10	0.1						
15	0.1						
20	0.2						
30	0.4	0.1					
40	0.7	0.2	0.1				
50	1.0	0.2	0.1				
60	1.4	0.3	0.1				
70	1.9	0.5	0.2	0.1			
80	2.4	0.6	0.2	0.1			
90	2.9	0.7	0.3	0.1			
100	3.6	0.9	0.6	0.1			
150	7.6	1.9	1.1	0.3	0.1		
200	12.9	3.2	1.6	0.4	0.1		
250	19.5	4.8	2.3	0.7	0.2	0.1	
300	27.3	6.7	3.9	0.9	0.2	0.1	
400	46.5	11.5	5.8	1.6	0.4	0.1	0.1
500	70.3	17.3	8.2	2.4	0.6	0.2	0.1
600	98.5	24.3	10.9	3.4	0.8	0.3	0.1
700		32.3	13.9	4.5	1.1	0.4	0.2
800		41.3	17.3	5.7	1.4	0.5	0.2
900		51.4	21.1	7.1	1.8	0.6	0.2
1000		62.5	29.5	8.7	2.1	0.7	0.3
1200		87.5	44.6	12.1	3.0	1.0	0.4
1500			76.0	18.4	4.5	1.5	0.6
2000				31.3	7.7	2.6	1.1
3000				66.2	16.3	5.5	2.3
4000					27.8	9.4	3.9
5000					41.9	14.1	5.8

FLOW (GPM)	3"	4"	5"	6"	8"	10"	12"
5							
10							
15	0.1						
20	0.2						
30	0.3	0.1					
40	0.6	0.1					
50	0.9	0.2	0.1				
60	1.2	0.3	0.1				
70	1.6	0.4	0.1	0.1			
80	2.0	0.5	0.2	0.1			
90	2.5	0.6	0.2	0.1			
100	3.1	0.8	0.3	0.1			
150	6.5	1.6	0.5	0.2	0.1		
200	11.1	2.7	0.9	0.4	0.1		
250	16.8	4.1	1.4	0.6	0.1		
300	23.6	5.8	2.0	0.8	0.2	0.1	
400	40.1	9.9	3.3	1.4	0.3	0.1	
500	60.7	14.9	5.0	2.1	0.5	0.2	0.1
600	85.0	20.9	7.1	2.9	0.7	0.2	0.1
700		27.8	9.4	3.9	1.0	0.3	0.1
800		35.6	12.0	4.9	1.2	0.4	0.2
900		44.3	15.0	6.2	1.5	0.5	0.2
1000		53.9	18.2	7.5	1.8	0.6	0.3
1200		75.5	25.5	10.5	2.6	0.9	0.4
1500			38.5	15.8	3.9	1.3	0.5
2000			65.5	27.0	6.6	2.2	0.9
3000				57.1	14.1	4.7	2.0
4000				97.2	23.9	8.1	3.3
5000					36.2	12.2	5.0

FRICION LOSS IN VARIOUS PIPE MATERIALS (C=120)

FRICION LOSS IN VARIOUS PIPE MATERIALS (C=130)

FRICION LOSS IN VARIOUS PIPE MATERIALS (C=140)

FRICION LOSS IN VARIOUS PIPE MATERIALS (C=150)

FLOW (GPM)	3"	4"	5"	6"	8"	10"	12"
5							
10							
15	0.1						
20	0.1						
30	0.3	0.1					
40	0.5	0.1					
50	0.7	0.2	0.1				
60	1.0	0.3	0.1				
70	1.4	0.3	0.1				
80	1.8	0.4	0.1	0.1			
90	2.2	0.5	0.2	0.1			
100	2.7	0.7	0.2	0.1			
150	5.7	1.4	0.5	0.2			
200	9.7	2.4	0.8	0.3	0.1		
250	14.7	3.6	1.2	0.5	0.1		
300	20.6	5.1	1.7	0.7	0.2	0.1	
400	35.0	8.6	2.9	1.2	0.3	0.1	
500	52.9	13.0	4.4	1.8	0.4	0.2	0.1
600	74.1	18.3	6.2	2.5	0.6	0.2	0.1
700	98.5	24.3	8.2	3.4	0.8	0.3	0.1
800		31.1	10.5	4.3	1.1	0.4	0.1
900		38.6	13.0	5.4	1.3	0.4	0.2
1000		47.0	15.8	6.5	1.6	0.5	0.2
1200		65.8	22.2	9.1	2.3	0.8	0.3
1500		99.4	33.5	13.8	3.4	1.1	0.5
2000			57.1	23.5	5.8	2.0	0.8
3000				49.8	12.3	4.1	1.7
4000				84.7	20.9	7.0	2.9
5000					31.5	10.6	4.4

FLOW (GPM)	3"	4"	5"	6"	8"	10"	12"
5							
10							
15	0.1						
20	0.1						
30	0.3	0.1					
40	0.4	0.1					
50	0.7	0.2	0.1				
60	0.9	0.2	0.1				
70	1.2	0.3	0.1				
80	1.6	0.4	0.1	0.1			
90	2.0	0.5	0.2	0.1			
100	2.4	0.6	0.2	0.1			
150	5.0	1.2	0.4	0.2			
200	8.5	2.1	0.7	0.3	0.1		
250	12.9	3.2	1.1	0.4	0.1		
300	18.1	4.5	1.5	0.6	0.2	0.1	
400	30.8	7.6	2.6	1.1	0.3	0.1	
500	46.5	11.5	3.9	1.6	0.4	0.1	0.1
600	65.2	16.1	5.4	2.2	0.5	0.2	0.1
700	86.7	21.4	7.2	3.0	0.7	0.2	0.1
800		27.4	9.2	3.8	0.9	0.3	0.1
900		34.0	11.5	4.7	1.2	0.4	0.2
1000		41.3	13.9	5.7	1.4	0.5	0.2
1200		57.9	19.5	8.0	2.0	0.7	0.3
1500		87.5	29.5	12.1	3.0	1.0	0.4
2000			50.3	20.7	5.1	1.7	0.7
3000				43.8	10.8	3.6	1.5
4000				74.6	18.4	6.2	2.6
5000					27.8	9.4	3.9

FRICION LOSS IN VARIOUS PIPE MATERIALS (C=140)

FRICION LOSS IN VARIOUS PIPE MATERIALS (C=150)

WATER FLOW PRESSURE LOSS (PSI PER 100 FEET OF HOSE)

WATER FLOW PRESSURE LOSS (PSI PER 100 FEET OF HOSE)

FLOW OF WATER IN U.S. GAL. PER MIN.	FLOW OF WATER IN CU. FEET PER SEC.	ACTUAL INTERNAL DIAMETER, INCHES						
		4	6	8	10	12	14	16
100	.233	.26						
125	.278	.40						
150	.334	.54						
175	.390	.70	.10					
200	.446	.90	.13					
225	.501	1.08	.16					
250	.557	1.34	.19					
275	.613	1.60	.25					
300	.668	1.84	.28					
325	.724	2.04	.33					
350	.780	2.30	.37					
375	.836	2.80	.44					
400	.891	3.10	.49					
425	.947	3.40	.54					
450	1.00	3.80	.60					
475	1.06	4.25	.70					
500	1.11	4.60	.78	.16				
550	1.22	5.60	.93	.18				
600	1.34	6.60	1.10	.23				
650	1.45	7.60	1.30	.27				
700	1.56	8.60	1.50	.30				
750	1.67	9.60	1.70	.34				
800	1.78	10.80	1.90	.39				
850	1.89	12.00	2.20	.44				
900	2.00		2.40	.49				
950	2.12		2.60	.54				

FLOW OF WATER IN U.S. GAL. PER MIN.	FLOW OF WATER IN CU. FEET PER SEC.	ACTUAL INTERNAL DIAMETER, INCHES							
		4	6	8	10	12	14	16	
1000	2.23		2.80	.59	.19				
1100	2.45		3.20	.66	.23				
1200	2.67		3.70	.74	.27				
1300	2.90		4.50	.88	.31				
1400	3.12		5.30	1.10	.35	.15			
1500	3.34		6.20	1.25	.40	.17			
1600	3.56		7.00	1.40	.45	.19			
1800	4.01		8.80	1.80	.54	.24			
2000	4.45		16.50	2.20	.64	.29	.14		
2500	5.57			3.40	.98	.42	.21		
3000	6.68			4.50	1.40	.58	.29	.14	
3500	7.80			6.20	1.90	.79	.39	.18	
4000	8.91			10.20	2.40	1.00	.50	.23	
4500	10.03				3.00	1.25	.62	.28	
5000	11.14				3.80	1.50	.74	.34	
6000	13.37				5.20	2.10	1.10	.46	
7000	15.60				7.00	2.80	1.40	.62	
8000	17.82				9.20	3.70	1.80	.80	
9000	20.05				11.50	4.60	2.30	1.00	
10000	22.28					5.70	2.80	1.25	
12000	26.74					6.70	3.70	1.70	
14000	31.19						10.00	5.00	2.40
16000	35.65						13.50	6.80	3.30
18000	40.10							8.80	4.40
20000	44.56							11.00	5.50

WATER FLOW PRESSURE LOSS (PSI PER 100 FEET OF HOSE)

WATER FLOW PRESSURE LOSS (PSI PER 100 FEET OF HOSE)

PVC DISCHARGE HOSE ELONGATION PRESSURE (PSI)

SIZE	10 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	70 PSI	80 PSI
1 ½"	0.0	0.0	0.0	0.0	0.1	0.15	0.2	0.4
2"	0.0	0.0	0.1	0.2	0.3	0.4	0.7	1.0
2 ½"	0.0	0.0	0.0	0.2	0.5	0.7	0.8	1.4
3"	0.0	0.0	0.1	0.2	0.7	1.2	1.4	-
4"	0.1	0.3	0.6	1.4	2.0	2.2	2.4	-
6"	0.1	0.3	0.5	1.3	2.0	-	-	-
8"	0.5	2.0	2.8	4.2	-	-	-	-
10"	0.5	1.0	1.8	-	-	-	-	-
12"	4.0	6.0	7.0	-	-	-	-	-

NOTE:

PVC Discharge Hoses: Longitudinal Elongation(%) based on pressure. Base Temperature 68°F on flat ground only. If temperature exceeds 110°F, the working pressure will go down. Nitrile-based Hoses have a working temperature between -56°F to 186°F.

Please consult your hose manufacturer for exact specifications.

END FORCE PRESSURE (LBS.)

HOSE ID	25 PSI	50 PSI	75 PSI	100 PSI	150 PSI	200 PSI	250 PSI	300 PSI	500 PSI	1000 PSI
2"	79	157	236	314	471	628	785	942	1571	3142
2-½"	123	245	368	491	736	982	1227	1473	2454	4909
3"	177	353	530	707	1060	1414	1767	2121	3534	7069
4"	314	628	942	1257	1885	2513	3142	3770	6283	12566
5"	491	982	1473	1964	2945	3927	4909	5891	9818	19635
6"	707	1414	2121	2827	4241	5655	7069	8482	14137	28274
8"	1257	2513	3770	5027	7540	10053	12566	15080	25133	50266
10"	1964	3927	5891	7854	11781	15708	19635	23562	39270	78540
12"	2827	5655	8482	11310	16965	22620	28274	33929	56549	113098

NOTE:

For hose I.D.'s from 2" to 12" the force in pounds is greater than the PSI. FORCE is the dynamic power which is exported longitudinally through a hose, towards the ends.

Please call or see our main catalog for our complete line of fittings.

**BLACK STEEL WELD ON
ALUMINUM
STAINLESS STEEL**

***DON'T FORGET ABOUT
OUR SPECIALTY ITEMS!***

GALVANIZED: B-STYLE HOSE SET ORDERING INFO

GALVANIZED: B-STYLE HOSE SET ORDERING INFO



SIZE	PART NUMBER	WEIGHT
GALVANIZED HOSE SET ASSEMBLY		
2"	275 HSA2	2.60 lbs.
3"	275 HSA3	5.10 lbs.
4"	275 HSA4	11.55 lbs.
5"	275 HSA5	16.60 lbs.
6"	275 HSA6	21.85 lbs.
8"	275 HSA8	35.15 lbs.



SIZE	PART NUMBER	WEIGHT
GALVANIZED BALL/MALE HOSE END		
2"	260 HTM2	0.80 lbs.
3"	260 HTM3	1.45 lbs.
4"	260 HTM4	3.45 lbs.
5"	260 HTM5	4.75 lbs.
6"	260 HTM6	5.90 lbs.
8"	260 HTM8	10.45 lbs.



SIZE	PART NUMBER	WEIGHT
GALVANIZED SOCKET/FEMALE HOSE END		
2"	270 HTF2	0.80 lbs.
3"	270 HTF3	1.04 lbs.
4"	270 HTF4	3.60 lbs.
5"	270 HTF5	5.40 lbs.
6"	270 HTF6	6.65 lbs.
8"	270 HTF8	11.55 lbs.

Only Wil-loc has the wedge-shaped barb on the 4", 6", and 8" sizes.

SIZE	PART NUMBER	WEIGHT
GALVANIZED LOCKING LEVER		
2"	273 LR2	1.0 lbs.
3"	273 LR3	2.25 lbs.
4"	273 LR4	4.40 lbs.
5"	273 LR5	6.45 lbs.
6"	273 LR6	9.35 lbs.
8"	273 LR8	13.15 lbs.



SIZE	PART NUMBER	WEIGHT
O-RING		
2"	280 OR2	0.05 lbs.
3"	280 OR3	0.10 lbs.
4"	280 OR4	0.20 lbs.
5"	280 OR5	0.20 lbs.
6"	280 OR6	0.45 lbs.
8"	280 OR8	0.55 lbs.



SIZE	PART NUMBER	WEIGHT
GALVANIZED DOUBLE HOSE CONNECTION		
2"	278 DHC2	1.0 lbs.
3"	278 DHC3	1.15 lbs.
4"	278 DHC4	3.95 lbs.
6"	278 DHC6	6.80 lbs.
8"	278 DHC8	14.70 lbs.



GALVANIZED: A-STYLE HOSE SET ORDERING INFO

GALVANIZED: NPT THREADED ORDERING INFO



10" HOSE SET SHOWN.

SIZE	PART NUMBER	WEIGHT
GALVANIZED HOSE SET ASSEMBLY		
10"	276 HSA10	54.60 lbs.
12"	276 HSA12	88.80 lbs.
12" Hose Set Assembly comes with a locking bar.		



GALVANIZED BALL/MALE HOSE TAIL		
10"	261 HTM10	20.75 lbs.
12"	261 HTM12	30.40 lbs.
All 10" and 12" A-Style Hose Sets come with a locking ring.		



10" FEMALE SHOWN.

GALVANIZED SOCKET/FEMALE HOSE TAIL		
10"	271 HTF10	25.55 lbs.
12"	271 HTF12	44.50 lbs.
12" Hose Set Assembly comes with a locking bar.		



GALVANIZED LOCKING RING		
10"	251 G10R	8.35 lbs.
12"	251 G12R	13.90 lbs.

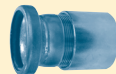


O-RING		
10"	281 OR10	1.05 lbs.
12"	281 OR12	1.55 lbs.



GALVANIZED DOUBLE END HOSE CONNECTION		
10"	278 DHC10	
12"	278 DHC12	22.45 lbs.

SIZE	PART NUMBER	WEIGHT
GALVANIZED MALE THREADED LONG BALL/MALE		
2"	020 BMT2	3.0 lbs.
3"	020 BMT3	6.70 lbs.
4"	020 BMT4	10.40 lbs.
6"	020 BMT6	22.45 lbs.
8"	020 BMT8	37.55 lbs.
GALVANIZED MALE THREADED SHORT BALL/MALE		
2"	022 BMT2	2.0 lbs.
3"	022 BMT3	4.05 lbs.
4"	022 BMT4	7.70 lbs.
6"	022 BMT6	15.90 lbs.
8"	022 BMT8	25.15 lbs.
GALVANIZED FEMALE THREADED SHORT BALL/MALE		
2"	025 BFTA2	3.0 lbs.
3"	025 BFTA3	6.02 lbs.
4"	025 BFTA4	12.25 lbs.
6"	025 BFTA6	26.20 lbs.
8"	025 BFTA8	50.60 lbs.
GALVANIZED MALE THREADED SOCKET/FEMALE		
2"	040 SMT2	1.10 lbs.
3"	040 SMT3	1.75 lbs.
4"	040 SMT4	3.50 lbs.
6"	040 SMT6	6.80 lbs.
8"	040 SMT8	14.05 lbs.
GALVANIZED FEMALE THREADED SOCKET/FEMALE		
2"	045 SFTA2	2.05 lbs.
3"	045 SFTA3	5.10 lbs.
4"	045 SFTA4	8.05 lbs.
6"	045 SFTA6	17.10 lbs.
8"	045 SFTA8	39.50 lbs.

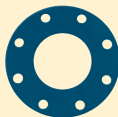


GALVANIZED: A-STYLE HOSE SET ORDERING INFO

GALVANIZED: NPT THREADED ORDERING INFO

GALVANIZED: PUMP FLANGE ORDERING INFO

GALVANIZED: A-STYLE PUMP FITTING ORDERING INFO



SIZE	PART NUMBER	WEIGHT
GALVANIZED DISCHARGE FLANGE BALL/MALE		
3"	010 F3M	11.60 lbs.
4"	010 F4M	17.15 lbs.
6"	010 F6M	27.90 lbs.
8"	010 F8M	39.85 lbs.
GALVANIZED SUCTION FLANGE SOCKET/FEMALE		
3"	030 F3F	8.90 lbs.
4"	030 F4F	12.05 lbs.
6"	030 F6F	16.0 lbs.
8"	030 F8F	24.30 lbs.
GALVANIZED REDUCING FLANGE - MALE/FEMALE		
6"	033 F6-4M	23.25 lbs.
8"	033 F8-6M	43.75 lbs.
6"	032 F6-4F	14.0 lbs.
8"	032 F8-6F	22.0 lbs.
GALVANIZED INCREASING FLANGE - MALE/FEMALE		
4"	033 F4-6M	16.0 lbs.
6"	033 F6-8M	51.75 lbs.
4"	032 F4-6F	26.75 lbs.
6"	032 F6-8F	21.0 lbs.
FLANGED NEOPRENE GASKET		
3"	288 FGN3	0.20 lbs.
4"	288 FGN4	0.30 lbs.
6"	288 FGN6	0.35 lbs.
8"	288 FGN8	0.35 lbs.
10"	289 FGN10	0.50 lbs.
12"	289 FGN12	0.65 lbs.

1/8" thickness. 1/4" thickness available/full faced.

NOTE: All Flanges are designed to ASA 150 series hole specifications.

SIZE	PART NUMBER	WEIGHT
GALVANIZED DISCHARGE FLANGE BALL/MALE		
10"	011 F10M	41.60 lbs.
12"	011 F12M	64.35 lbs.

All Flanges are designed to ASA hole specifications.



SIZE	PART NUMBER	WEIGHT
GALVANIZED SUCTION FLANGE SOCKET/FEMALE		
10"	031 F10F	39.20 lbs.
12"	031 F12F	78.80 lbs.

All Flanges are designed to ASA hole specifications.



SIZE	PART NUMBER	WEIGHT
INCREASING & REDUCING FLANGE BALL/MALE		
10"	034 F10-12M	90.0 lbs.
12"	034 F12-10M	54.75 lbs.

All Flanges are designed to ASA hole specifications.



B-STYLE COUPLING SHOWN.

SIZE	PART NUMBER	WEIGHT
INCREASING & REDUCING FLANGE SOCKETS/FEMALE		
10"	035 F10-12F	93.0 lbs.
12"	035 F12-10F	53.50 lbs.

All Flanges are designed to ASA hole specifications.



B-STYLE COUPLING SHOWN.

SIZE	PART NUMBER	WEIGHT
GALVANIZED MALE THREADED DISCHARGE BALL/MALE		
10"	021 BMT10	35.50 lbs.
12"	021 BMT12	63.80 lbs.

Threads are cut to NPT specifications.



SIZE	PART NUMBER	WEIGHT
GALVANIZED MALE THREADED SUCTION SOCKET/FEMALE		
10"	041 SMT10	30.0 lbs.
12"	041 SMT12	NA

Includes locking ring.



GALVANIZED: A-STYLE PUMP FITTING ORDERING INFO

GALVANIZED: PUMP FLANGE ORDERING INFO

GALVANIZED: ELBOW ORDERING INFO

GALVANIZED: ELBOWS, INCREASERS & REDUCER ORDERING INFO

GALVANIZED: ELBOW ORDERING INFO



SIZE	PART NUMBER	WEIGHT
GALVANIZED 90° ELBOW		
2"	070 E2-90	2.65 lbs.
3"	070 E3-90	5.20 lbs.
4"	070 E4-90	10.85 lbs.
6"	070 E6-90	22.15 lbs.
8"	070 E8-90	32.45 lbs.



SIZE	PART NUMBER	WEIGHT
GALVANIZED 60° ELBOW		
2"	075 E2-60	2.30 lbs.
3"	075 E3-60	4.65 lbs.
4"	075 E4-60	10.05 lbs.
6"	075 E6-60	20.0 lbs.
8"	075 E8-60	26.0 lbs.



SIZE	PART NUMBER	WEIGHT
GALVANIZED 45° ELBOW		
2"	080 E2-45	2.15 lbs.
3"	080 E3-45	4.40 lbs.
4"	080 E4-45	9.30 lbs.
6"	080 E6-45	18.20 lbs.
8"	080 E8-45	28.10 lbs.



SIZE	PART NUMBER	WEIGHT
GALVANIZED 30° ELBOW		
2"	085 E2-30	2.0 lbs.
3"	085 E3-30	4.50 lbs.
4"	085 E4-30	10.0 lbs.
6"	085 E6-30	17.75 lbs.
8"	085 E8-30	30.0 lbs.

SIZE	PART NUMBER	WEIGHT
GALVANIZED A-STYLE 90° ELBOW		
10"	086 E10-90	50.0 lbs.
12"	086 E12-90	81.0 lbs.
GALVANIZED A-STYLE 45° ELBOW		
10"	086 E10-45	44.0 lbs.
12"	086 E12-45	71.75 lbs.



45° A-STYLE ELBOW SHOWN.

SIZE	PART NUMBER	WEIGHT
GALVANIZED INCREASER		
2" x 3"	150 IN2-3M	3.70 lbs.
2" x 4"	150 IN2-4M	7.90 lbs.
3" x 4"	150 IN3-4M	7.50 lbs.
3" x 6"	150 IN3-6M	14.75 lbs.
3" x 8"	150 IN3-8M	23.40 lbs.
4" x 6"	150 IN4-6M	15.25 lbs.
4" x 8"	150 IN4-8M	24.55 lbs.
6" x 8"	150 IN6-8M	25.45 lbs.



B-STYLE COUPLING SHOWN.

SIZE	PART NUMBER	WEIGHT
GALVANIZED A-STYLE INCREASER		
8" x 10"	151 IN8-10M	50.0 lbs.
8" x 12"	151 IN8-12M	74.0 lbs.
10" x 12"	151 IN10-12M	98.50 lbs.

12" Sockets come with a closing bar.

NOTE: 12" Sockets come with a closing bar.

GALVANIZED: ELBOWS, INCREASERS & REDUCER ORDERING INFO

GALVANIZED: INCREASERS & REDUCER ORDERING INFO

GALVANIZED: T & Y ORDERING INFO



B-STYLE COUPLING SHOWN.

SIZE	PART NUMBER	WEIGHT
GALVANIZED REDUCER		
3" x 2"	160 R3-2M	2.65 lbs.
4" x 3"	160 R4-3M	5.70 lbs.
6" x 2"	160 R6-2M	6.55 lbs.
6" x 3"	160 R6-3M	9.65 lbs.
6" x 4"	160 R6-4M	10.95 lbs.
8" x 2"	160 R8-2M	9.30 lbs.
8" x 3"	160 R8-3M	16.20 lbs.
8" x 4"	160 R8-4M	18.15 lbs.
8" x 6"	160 R8-6M	21.85 lbs.

SIZE	PART NUMBER	WEIGHT
GALVANIZED A-STYLE REDUCER		
10" x 8"	161 R10-8M	71.30 lbs.
12" x 8"	161 R12-8M	102.50 lbs.
12" x 10"	161 R12-10M	160.0 lbs.

12" Sockets come with a closing bar.

SIZE	PART NUMBER	WEIGHT
GALVANIZED MODULAR S-BEND		
4"	162 SBMA4	68.0 lbs.
6"	162 SBMA6	81.0 lbs.
8"	162 SBMA8	125.0 lbs.



SIZE	PART NUMBER	WEIGHT
GALVANIZED STD T'S WITH MALE/BALL CONNECTION		
2"	060 T2M	4.70 lbs.
3"	060 T3M	9.0 lbs.
4"	060 T4M	22.0 lbs.
6"	060 T6M	34.25 lbs.
8"	060 T8M	55.45 lbs.
10"	061 T10M	NA
12"	061 T12M	135.0 lbs.

All 12" T's come with a closing bar.

SIZE	PART NUMBER	WEIGHT
GALVANIZED T'S WITH FEMALE/SOCKET CONNECTION		
2"	050 T2F	3.25 lbs.
3"	050 T3F	6.60 lbs.
4"	050 T4F	13.60 lbs.
6"	050 T6F	24.30 lbs.
8"	050 T8F	43.0 lbs.
10"	054 T10F	NA
12"	054 T12F	125.0 lbs.

All 12" T's come with a closing bar.

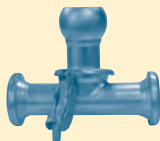


GALVANIZED: T & Y ORDERING INFO

GALVANIZED: SYSTEM COMPONENT ORDERING INFO

GALVANIZED: T & Y ORDERING INFO

GALVANIZED: SYSTEM COMPONENT ORDERING INFO



SIZE	PART NUMBER	WEIGHT
GALVANIZED INLINE T'S WITH MALE/BALL CONNECTION		
2"	051 LT2M	3.65 lbs.
3"	051 LT3M	6.65 lbs.
4"	051 LT4M	13.90 lbs.
6"	051 LT6M	26.40 lbs.
8"	051 LT8M	43.90 lbs.
10"	052 LT10M	NA
12"	052 LT12M	125.0 lbs.

All 12" T's come with a closing bar.



GALVANIZED DOUBLE FEMALE Y'S - MALE/BALL		
4"	064 YM4	19.15 lbs.
6"	064 YM6	32.40 lbs.
8"	064 YM8	43.45 lbs.
10"	065 YM10	117.0 lbs.
12"	065 YM12	204.0 lbs.

12" Y Sockets come with a closing bar.

GALVANIZED DOUBLE FEMALE Y'S - INCREASING MALE/BALL		
2 - 4" x 6"	066 Y14-6	43.0 lbs.
2 - 6" x 8"	066 Y16-8	66.0 lbs.
2 - 8" x 10"	067 Y18-10	79.0 lbs.
2 - 8" x 12"	067 Y18-12	114.0 lbs.
2 - 10" x 12"	067 Y110-12	165.0 lbs.

12" Y Sockets come with a closing bar. Product not shown.

SIZE	PART NUMBER	WEIGHT
GALVANIZED END PLUG BALL/MALE		
2"	090 EP2	1.05 lbs.
3"	090 EP3	2.35 lbs.
4"	090 EP4	4.45 lbs.
6"	090 EP6	8.80 lbs.
8"	090 EP8	10.75 lbs.



GALVANIZED A-STYLE END PLUG BALL/MALE		
10"	091 EP10	22.20 lbs.
12"	091 EP12	36.15 lbs.



GALVANIZED END CAP SOCKET/FEMALE		
2"	100 EC2	0.40 lbs.
3"	100 EC3	0.75 lbs.
4"	100 EC4	1.95 lbs.
6"	100 EC6	3.90 lbs.
8"	100 EC8	7.30 lbs.



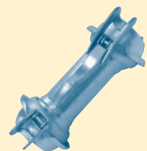
GALVANIZED A-STYLE END CAP SOCKET/FEMALE		
10"	101 EC10	17.90 lbs.
12"	101 EC12	35.40 lbs.

12" End Caps come with a closing bar.



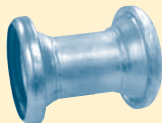
GALVANIZED: SYSTEM COMPONENT ORDERING INFO

GALVANIZED PIPE ORDERING INFO & SPECS



B-STYLE DOUBLE BALL SHOWN.

SIZE	PART NUMBER	WEIGHT
GALVANIZED DOUBLE BALL/MALE		
2"	110 DB2	3.50 lbs.
3"	110 DB3	6.80 lbs.
4"	110 DB4	13.60 lbs.
6"	110 DB6	28.80 lbs.
8"	110 DB8	41.60 lbs.
10"	111 DB10	54.0 lbs.
12"	111 DB12	96.0 lbs.



B-STYLE DOUBLE SOCKET SHOWN.

SIZE	PART NUMBER	WEIGHT
GALVANIZED DOUBLE SOCKET/FEMALE		
2"	120 DS2	0.90 lbs.
3"	120 DS3	1.75 lbs.
4"	120 DS4	4.95 lbs.
6"	120 DS6	7.80 lbs.
8"	120 DS8	15.0 lbs.
10"	121 DS10	42.0 lbs.
12"	121 DS12	87.0 lbs.

SIZE	PART NUMBER	WEIGHT
4" GALVANIZED PIPE		
4" x 6'	220 P4-6	21.0 lbs.
4" x 10'	220 P4-10	33.0 lbs.
4" x 20'	220 P4-20	60.0 lbs.
6" GALVANIZED PIPE		
6" x 3'	220 P6-3	28.0 lbs.
6" x 6'	220 P6-6	35.0 lbs.
6" x 10'	220 P6-10	55.0 lbs.
6" x 20'	220 P6-20	93.0 lbs.
8" GALVANIZED PIPE		
8" x 3'	220 P8-3	43.0 lbs.
8" x 6'	220 P8-6	52.0 lbs.
8" x 10'	220 P8-10	78.0 lbs.
8" x 20'	220 P8-20	120.0 lbs.
10" GALVANIZED PIPE		
10" x 10'	221 P10-10	63.0 lbs.
10" x 20'	221 P10-20	209.0 lbs.
12" GALVANIZED PIPE		
12" x 10'	221 P12-10	173.0 lbs.
12" x 20'	221 P12-20	278.0 lbs.



B-STYLE GALVANIZED PIPE SHOWN.

NOTE: All 10" and 12" Pipe have A-Style couplings.

GALVANIZED PIPE SPECIFICATIONS					
	ID (IN)	WALL (IN)	WALL (MM)	MAX (PSI)	VACUUM
4"	4.25	0.059	1.5	175	30
6"	6.0	0.059	1.5	175	30
8"	8.0	0.059	1.5	175	30
10"	10.0	0.079	2.0	88	30
12"	12.0	0.079	2.0	88	30

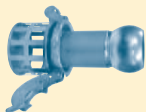
NOTE: Specifications to 1/8." Specifications subject to change.

GALVANIZED: SYSTEM COMPONENT ORDERING INFO

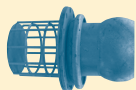
GALVANIZED PIPE ORDERING INFO & SPECS

SPECIALTY: STRAINER BASKET ORDERING INFO

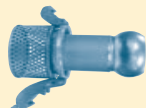
SPECIALTY: STRAINER BASKET & WIL-LUBE ORDERING INFO



SIZE	PART NUMBER	WEIGHT
SQUARE STRAINER BASKETS <i>2pc. with Threaded Ball/Male</i>		
2"	316 SBTSA2C	4.50 lbs.
3"	316 SBTSA3C	8.05 lbs.
4"	316 SBTSA4C	14.0 lbs.
6"	316 SBTSA6C	27.15 lbs.
8"	316 SBTSA8C	58.55 lbs.



SIZE	PART NUMBER	WEIGHT
SQUARE STRAINER BASKETS <i>2pc. Flange Strainer Ball</i>		
10"	316 SBTSA10C	85.0 lbs.
12"	316 SBTSA12C	114.0 lbs.
A-Style coupling		



SIZE	PART NUMBER	WEIGHT
ROUND STRAINER BASKETS/B-STYLE COUPLING <i>2pc. with Threaded Long Ball/Male</i>		
2"	319 SBTRA2C	4.90 lbs.
3"	319 SBTRA3C	8.75 lbs.
4"	319 SBTRA4C	13.20 lbs.
6"	319 SBTRA6C	26.95 lbs.
8"	319 SBTRA8C	51.40 lbs.



SIZE	PART NUMBER	WEIGHT
ROUND STRAINER BASKETS/A-STYLE COUPLING		
10"	319 SBTRA10C	53.0 lbs.
12"	319 SBTRA12C	78.0 lbs.

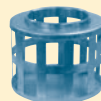
SIZE	PART NUMBER	WEIGHT
SQUARE STRAINER BASKETS <i>Flange Square Strainer</i>		
10"	316 SFSB10	42.0 lbs.
12"	316 SFSB12	48.0 lbs.
A-Style coupling		

SIZE	PART NUMBER	WEIGHT
SQUARE REPLACEMENT BASKETS		
2"	317 STRB2	1.40 lbs.
3"	317 STRB3	1.95 lbs.
4"	317 STRB4	2.48 lbs.
6"	317 STRB6	6.05 lbs.
8"	317 STRB8	21.0 lbs.

SIZE	PART NUMBER	WEIGHT
ROUND REPLACEMENT BASKETS		
2"	318 STRB2	1.80 lbs.
3"	318 STRB3	2.65 lbs.
4"	318 STRB4	2.60 lbs.
6"	318 STRB6	5.80 lbs.
8"	318 STRB8	13.0 lbs.

SIZE	PART NUMBER	WEIGHT
WIL-LUBE TUB		
16 oz.	008LUB 16T	16 oz.
CASE	0000000000	24 lbs.
One case contains (24) 1 lb. tubs		

SIZE	PART NUMBER	WEIGHT
WIL-LUBE TUB SQUEEZE PACK		
1 oz.	008LUB 1.0P	1 oz.
BULK	008LUB 1.0P	
* A minimum order of 250 pieces is required for bulk pricing discounts.		



SPECIALTY: CLAMPS & PIN ORDERING INFO

POLYRON : MORE DETAILS

SPECIALTY: CLAMPS & PIN ORDERING INFO



SIZE	PART NUMBER	WEIGHT
PVC DISCHARGE SINGLE BOLT CLAMPS		
2"	302 CD2	51-55 lbs.
3"	302 CD3	79-85 lbs.
4"	302 CD4	104-112 lbs.
5"	302 CD5	130-140 lbs.
6"	302 CD6	150-162 lbs.
8"	302 CD8	200-213 lbs.

RUBBER DISCHARGE SINGLE BOLT CLAMPS		
2"	302 CD2X	55-59 lbs.
3"	302 CS3	85-91 lbs.
4"	302 CD4X	121-130 lbs.
6"	302 CD6X	174-187 lbs.
8"	302 CS8	213-226 lbs.

PVC/RUBBER SUCTION SINGLE BOLT CLAMPS		
2"	302 CS2	59-63 lbs.
3"	302 CS3	85-91 lbs.
4"	302 CS4	112-121 lbs.
5"	302 CS5	140-150 lbs.
6"	302 CS6	162-174 lbs.
8"	302 CS8	213-226 lbs.
10"	302 CS10	265-278 lbs.
12"	302 C12	317-330 lbs.



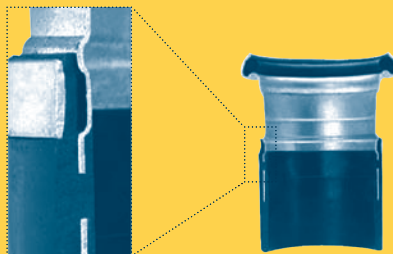
LEVER LOCKING SAFETY PINS		
2"	009 LLSP2	NA
3" - 4"	009 LLSP3-4	NA
6" - 8"	009 LLSP6-8	NA



ANATOMY OF THE POLYRON™ BOND

The precision hold pattern in the metal shank is machined to optimized the strength of the bond with HDPE.

The HDPE resin is allowed to bond with itself as it is injected through the hole pattern. Once it cools, the HDPE completely encapsulates the metal shank.



A metal compression ring seals the integrated gasket into place, creating an additional level of protection against any leak path.

PERFORMANCE OF POLYRON HDPE TRANSITION FITTINGS

Up to **50% LIGHTER** than any other transition fitting.
 Meets or **EXCEEDS PRESSURE & TEMPERATURE RATINGS** of HDPE pipe.
ELIMINATES LEAK PATHS created by torquing, bending or pressure loading.
PREVENTS THERMAL EXPANSION & CONTRACTION PROBLEMS at transition joints.

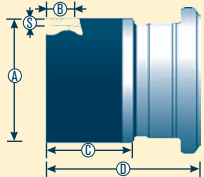
POLYRON: MORE DETAILS

POLYRON: HDPE FITTING ORDERING INFO & SPECS

MINI POLYRON: HDPE FITTING ORDERING INFO & SPECS

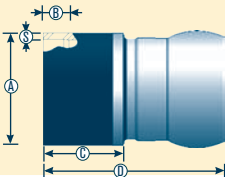


SIZE	PART NUMBER	WEIGHT
POLYRON SET X SDR17		
4"	925 BSA4SDR17	11.72 lbs.
6"	925 BSA6SDR17	23.12 lbs.
8"	925 BSA8SDR17	37.14 lbs.
12"	926 BSA12SDR17	109.83 lbs.
MALE WITH LL X SDR17		
4"	920 BL4SDR17	8.04 lbs.
6"	920 BL6SDR17	15.89 lbs.
8"	920 BL84SDR17	24.51 lbs.
12"	921 BL12SDR17	55.42 lbs.
FEMALE WITH O-R X SDR17		
4"	922 F04SDR17	3.68 lbs.
6"	922 F06SDR17	7.23 lbs.
8"	922 F08SDR17	12.63 lbs.
12"	923 F012SDR17	54.41 lbs.



FEMALE POLYRON WITH SDR17 SPECIFICATIONS

SIZE	A	B	C	D	S
4"	4.50	2.95	4.06	9.25	0.26
6"	6.63	2.60	5.98	10.63	0.39
8"	8.63	1.93	5.98	11.51	0.51
12"	12.75	4.29	10.0	16.85	0.75



MALE POLYRON WITH SDR17 SPECIFICATIONS

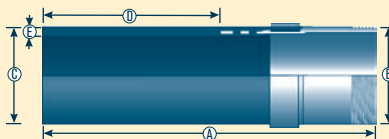
SIZE	A	B	C	D	S
4"	4.50	2.95	4.06	11.26	0.26
6"	6.63	2.60	5.98	12.60	0.39
8"	8.63	1.93	5.98	13.39	0.51
12"	12.75	4.29	10.0	19.69	0.75

Specifications to 1/100th." Subject to change.

SIZE	PART NUMBER	WEIGHT
STAINLESS STEEL 304 MALE THREADS X SDR 11		
1.0"	901 SSM100P11	3.96 lbs.
1.25"	901 SSM125P11	5.84 lbs.
1.50"	901 SSM150P11	6.94 lbs.
2.0"	901 SSM200P11	10.80 lbs.
3.0"	901 SSM300P11	
4.0"	901 SSM400P11	
6.0"	901 SSM600P11	

304 Stainless Steel x Tapered Male Threads - HDPE SDR 11 - molded PE 3408 Fitting.

MINI POLYRON SPECIFICATIONS					
SIZE	A	B	C	D	E
1.0"	8.15	1.44	1.31	4.33	0.12
1.25"	8.15	1.79	1.66	4.33	0.15
1.5"	8.15	2.52	1.90	4.33	0.17
2.0"	8.15	2.53	2.37	4.33	0.22



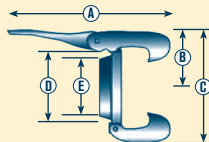
STAINLESS STEEL MINI POLYRON WITH MALE NPT X SDR 11

Specifications to 1/100th of an inch. Subject to change.

GALVANIZED: B-STYLE HOSE SET SPECS

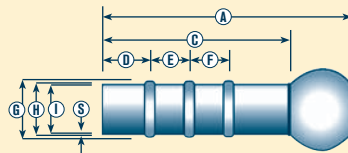
GALVANIZED: B-STYLE HOSE SETS SPECS

B-STYLE HOSE SETS SPECS	
Vacuum Rating	30 inches hg
Pressure Rating	2 & 3 inch = 290 psi
	4 - 8 inch = 175 psi
Number of Ribs	2 & 3 inch = 2
	4 - 8 inch = 3

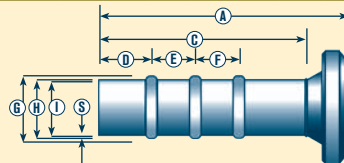


LEVER MECHANICAL SPECIFICATIONS						
		A	B	C	D	E
2"	50x50mm	7.09	3.35	4.92	3.94	2.44
3"	76x76mm	9.25	3.54	7.09	5.31	3.43
4"	108x100mm	10.83	6.69	9.25	7.48	5.20
5"	133x125mm	11.41	5.51	10.83	8.07	5.91
6"	159x150mm	13.39	6.30	11.81	9.06	6.69
8"	194x200mm	13.19	9.06	13.98	10.04	8.66

Specifications to 1/100th of an inch. Subject to change.



MALE MECHANICAL SPECIFICATIONS										
		A	C	D	E	F	G	H	I	S
2"	50x50mm	6.50	4.33	0.98	1.38		2.09	1.97	1.85	0.06
3"	76x76mm	8.07	5.31	1.38	1.38		3.11	2.99	2.87	0.06
4"	108x100mm	11.42	7.28	1.38	1.77	1.77	4.09	3.94	3.80	0.07
5"	133x125mm	11.61	7.87	1.38	1.77	1.77	5.08	4.92	4.78	0.07
6"	159x150mm	12.40	8.46	1.57	1.97	1.97	6.06	5.91	5.77	0.07
8"	194x200mm	14.96	9.84	1.97	2.36	2.36	8.11	7.87	7.71	0.08



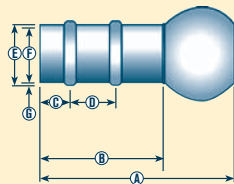
FEMALE MECHANICAL SPECIFICATIONS										
		A	C	D	E	F	G	H	I	S
2"	50x50mm	5.51	4.33	0.98	1.38		2.09	1.97	1.85	0.06
3"	76x76mm	6.69	5.31	1.38	1.38		3.11	2.99	2.87	0.06
4"	108x100mm	9.45	7.28	1.38	1.77	1.77	4.09	3.94	3.80	0.07
5"	133x125mm	10.04	7.87	1.38	1.77	1.77	5.08	4.92	4.78	0.07
6"	159x150mm	10.43	8.46	1.57	1.97	1.97	6.06	5.91	5.77	0.07
8"	194x200mm	12.99	9.84	1.97	2.36	2.36	8.11	7.87	7.71	0.08

GALVANIZED: A-STYLE HOSE SET SPECS

GALVANIZED: NPT THREADED FITTING SPECS

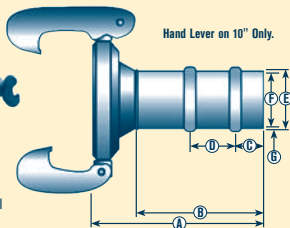
A-STYLE HOSE SETS SPECS

Vacuum Rating	30 inches hg
Pressure Rating	88 psi
Number of Ribs	2



MALE MECHANICAL SPECIFICATIONS

		A	B	C	D	E	F	G
10"	250mm x 150mm	18.54	11.81	3.54	4.72	10.08	9.84	0.98
12"	300mm x 300mm	18.54	11.81	3.54	4.72	12.05	11.81	0.98



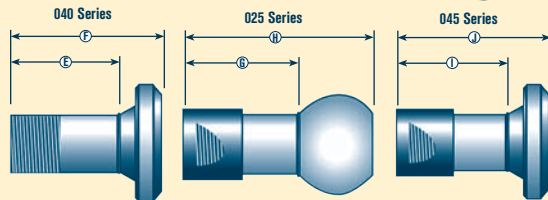
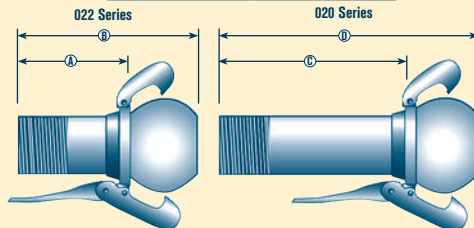
FEMALE MECHANICAL SPECIFICATIONS

		A	B	C	D	E	F	G
10"	250mm x 150mm	16.14	11.81	3.54	4.72	10.08	9.84	0.98
12"	300mm x 300mm	16.89	11.81	3.54	4.72	12.05	11.81	0.98

Specifications to 1/100th of an inch. Subject to change.

NPT THREADED FITTINGS SPECS

Vacuum Rating	30 inches hg
Pressure Rating	2 - 3" = 290 psi 4 - 8" = 175 psi



NPT MECHANICAL SPECIFICATIONS

		A	B	C	D	E	F	G	H	I	J
2"	50mm x 50mm	2.76	4.92	5.51	7.67	2.76	3.98	4.35	6.50	4.35	5.50
3"	76mm x 76mm	2.76	5.59	6.69	9.53	2.76	4.13	4.62	7.50	4.62	6.00
4"	108mm x 100mm	2.76	7.00	6.69	10.94	2.76	4.92	5.42	9.63	5.42	7.50
6"	159mm x 150mm	3.94	8.03	9.45	13.54	3.94	5.91	6.89	11.00	6.89	8.87
8"	194mm x 200mm	3.94	9.17	9.06	14.29	3.94	7.17	8.22	13.50	8.22	11.50

Specifications to 1/8th of an inch. Subject to change.

GALVANIZED: PUMP FLANGE SPECS

GALVANIZED: A-STYLE PUMP FITTING SPECS

PUMP FLANGES SPECS

Vacuum Rating	30 inches hg
Pressure Rating	3" = 290 psi 4 - 8" = 175 psi
Flange Pattern	ASA 150
Number Of Holes	3" has 4 bolt holes 4 - 8" has 8 bolt holes

MALE FLANGE SPECIFICATIONS

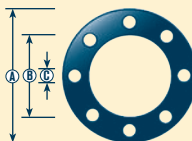
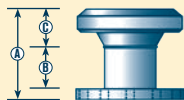
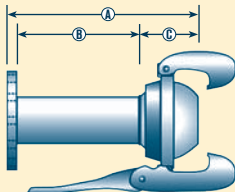
	A	B	C
3"	10.00	6.50	2.88
4"	11.88	7.00	3.50
6"	13.63	9.00	4.00
8"	15.63	9.88	5.25

FEMALE FLANGE SPECIFICATIONS

	A	B	C
3"	4.63	2.75	1.38
4"	6.50	4.00	2.25
6"	6.50	4.00	2.25
8"	7.75	4.00	3.25

ASA FLANGE SPECIFICATIONS

	A	B	C
3"	7.50	6.00	0.75
4"	9.00	7.50	0.75
6"	11.00	9.50	0.875
8"	13.50	11.95	0.875



Specifications to 1/8th of an inch. Subject to change.

PUMP FITTINGS SPECS

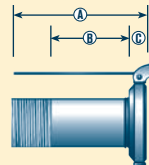
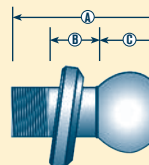
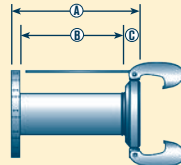
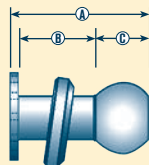
Vacuum Rating	30 inches hg
Pressure Rating	88 psi
Flange Pattern	ASA 150
Number Of Holes	12 Bolt Holes
Thread Pattern	NPT
NOTE:	Hand lever on 10" only.

A-STYLE FLANGE SPECIFICATIONS

FLANGE	A	B	C
10" Balls	13.25	6.00	6.75
12" Balls	15.00	6.00	8.38
10" Sockets	10.88	6.90	4.38
12" Sockets	21.75	16.00	5.75

A-STYLE NPT SPECIFICATIONS

THREADED	A	B	C
10" Balls	17.75	12.25	6.75
12" Balls	20.50	12.25	8.38
10" Sockets	15.75	12.00	4.37
12" Sockets	17.00	12.00	5.75

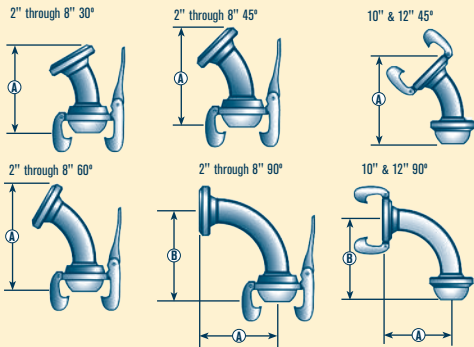


Specifications to 1/8th of an inch. Subject to change.

GALVANIZED: ELBOW SPECS

GALVANIZED: INCREASER & REDUCER SPECS

ELBOWS SPECS	
Vacuum Rating	30 inches hg
Pressure Rating	2 - 3" = 290 psi
	4 - 8" = 175 psi
	10 - 12" = 88 psi



ELBOW SPECIFICATIONS					
	30° A	45° A	60° A	90° A	90° B
2"	9.07	8.07	6.69	7.91	8.86
3"	11.02	9.84	8.27	9.33	10.75
4"	15.75	14.17	9.45	12.95	14.84
6"	20.47	17.72	14.37	18.58	20.59
8"	19.69	17.52	14.76	16.38	18.39
10"	22.64	20.47	17.72	17.72	20.12
12"	24.8	22.83	20.08	18.31	21.73

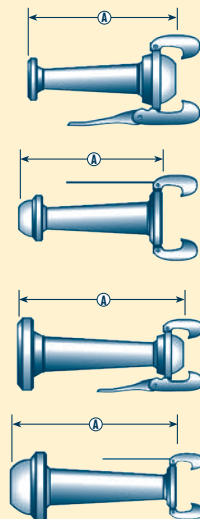
Specifications to 1/8th of an inch. Subject to change.

INCREASERS & REDUCERS SPECS	
Vacuum Rating	30 inches hg
Pressure Rating	2 - 3" = 290 psi
	4 - 8" = 175 psi
	10 - 12" = 88 psi

INCREASER SPECIFICATIONS	
	A
2" x 3"	9.84
3" x 4"	11.42
4" x 6"	12.00
6" x 8"	16.34
8" x 10"	21.75
8" x 12"	23.50
10" x 12"	24.75

REDUCER SPECIFICATIONS	
	A
3" x 2"	9.25
4" x 3"	11.23
6" x 2"	9.84
6" x 3"	11.02
6" x 4"	12.00
8" x 2"	13.00
8" x 3"	13.00
8" x 4"	17.32
8" x 6"	16.54
10" x 8"	22.50
12" x 8"	23.00
12" x 10"	24.00

Specifications to 1/8th of an inch. Subject to change.



GALVANIZED: T & Y SPECS

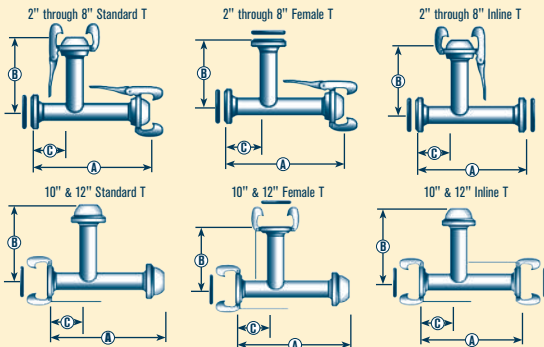
GALVANIZED: SYSTEM COMPONENT SPECS

T SPECS	
Vacuum Rating	30 inches hg
Pressure Rating	2 - 3" = 290 psi
	4 - 8" = 175 psi
	10 - 12" = 88 psi

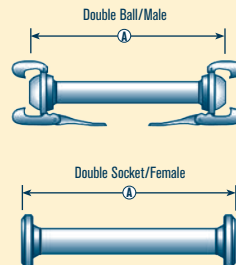
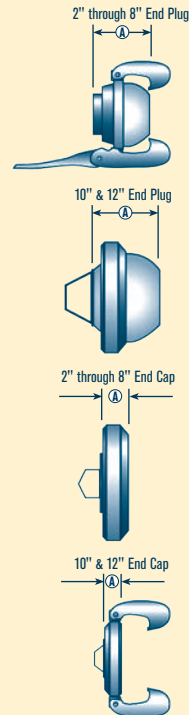
	T STANDARD MALE			T SOCKET FEMALE			T INLINE MALE		
	A	B	C	A	B	C	A	B	C
2"	14.02	7.09	2.36	14.02	4.13	2.36	13.03	7.09	2.36
3"	16.14	9.25	2.76	16.14	4.53	2.76	14.33	9.25	2.76
4"	20.32	11.42	2.76	30.32	5.71	2.76	13.78	11.42	2.76
6"	22.63	12.00	3.15	22.63	7.09	3.15	20.63	12.00	3.15
8"	27.68	13.00	3.94	27.68	9.25	3.94	25.67	13.00	3.94
10"	33.50	17.75	6.00	33.25	15.50	6.00	30.75	18.00	6.00
12"	37.50	20.50	6.00	37.50	17.25	6.00	34.25	20.50	6.00

	END PLUG BALL/ MALE SPECS (A)	END CAP SOCKET FEMALE SPECS (A)
2"	2.17	3.27
3"	2.87	4.57
4"	4.21	6.50
6"	4.06	8.31
8"	5.00	10.51
10"	6.73	9.72
12"	8.35	12.20

	DOUBLE BALL/ MALE SPECS. (A)	DOUBLE SOCKET/ FEMALE SPECS. (A)
2"	10.04	4.72
3"	11.42	4.92
4"	16.73	6.50
6"	15.75	7.09
8"	18.11	10.24



Specifications to 1/8th of an inch. Subject to change.



Specifications to 1/8th of an inch. Subject to change.

GALVANIZED: T & Y SPECS

GALVANIZED: SYSTEM COMPONENT SPECS

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