

Approx. Wt. Lbs.	Conn. Size	Dial Size	Description	Part Number	Pressure Range
1/3	1/4" Bottom	2 1/2"	Dry Gauge with Brass Tube & Socket	MUGAUGE15D	15
				MUGAUGE30D	30
				MUGAUGE60D	60
				MUGAUGED	100
				MUGAUGE160D	160
				MUGAUGE2D	200
				MUGAUGE3D	300
				GAG14458	400
				GAG14459	600
				GAG14461	1000

Approx. Wt. Lbs.	Conn. Size	Dial Size	Description	Part Number	Pressure Range
1/2	1/4" Bottom	2 1/2"	Liquid Filled with Brass Tube & Socket	MUGAUGEVAC30	30" Vac.
				MUGAUGEVAC30X30	30"x30#
				GAJ1008AL	30"x100#
				MUGAUGE15	0-15
				MUGAUGE30	0-30
				MUGAUGE60	0-60
				MUGAUGE	0-100
				MUGAUGE160	0-160
				MUGAUGE200	0-200
				MUGAUGE300	0-300
				MUGAUGE400	0-400
				MUGAUGE600	0-600
				MUGAUGE1000	0-1000
				MUGAUGE2000	0-2000
				MUGAUGE3000	0-3000
				MUGAUGE5000	0-5000

Approx. Wt. Lbs.	Conn. Size	Dial Size	Description	Part Number	Pressure Range
3/4	1/4" Back	2 1/2"	Dry Gauge with Brass Tube & Socket	GAJ5442	30
				GAJ5446	60
				GAJ5448	100
				GAJ5452	160
				GAG10128	200
				GAG10129	300
				GAG14458	400
				GAG14459	600
				GAJ5472	1000
				GAG19756	2000
				GAG19758	5000

Approx. Wt. Lbs.	Conn. Size	Dial Size	Description	Part Number	Pressure Range
1	1/4" Back	2 1/2"	Liquid Filled with Brass Tube & Socket	GAJ98152433	60
				MUGAUGE100CBL	100
				GAJ7252P	160
				GAJ98042014	200
				GAJ7258P	300
				GAJ98152438	400
				MUGAUGE600CBL	600
				MUGAUGE1000CBL	1000
				GAJ7274P	1500
				MUGAUGE3000CBL	3000
MUGAUGE5000CBL	5000				

## PRESSURE GAUGES



Pressure Gauge dial range should be twice the intended operating pressure range.

MODEL MUGAUGE LIQUID-FILLED BOTTOM MOUNT

### DRY GAUGE, BOTTOM MOUNT

#### Case Variations:

- 1/4" NPT bottom connection is standard except
- 1 1/2" size available with 1/8" NPT only.
- 1/8" NPT bottom connection can be furnished on 2" and 2 1/2" sizes.

#### Application:

To indicate pressure above atmospheric. Usable on air, oil, gas, water or any other pressure medium which does not attack bronze. Install protective syphon when used on steam.

### LIQUID FILLED BOTTOM MOUNT

#### Application:

For severe service requiring a waterproof, steamproof or weatherproof gauge, with the added problems of pulsation and vibration. Gauge has shock absorbing Polyglide movement plus liquid filling to absorb effect of vibration and pulsation.

### DRY GAUGE BACK MOUNT

Flush mounted type with studs and U-clamp for securing to panel. 1/4" NPT center back connection is standard. 1/8" NPT center back connection can be furnished.



Available in 2", 2 1/2" and 3 1/2" sizes only.


### LIQUID FILLED BACK MOUNT

#### Case Variations:

300 series stainless steel studs and U-clamp for panel mounting. 1/4" NPT center back connection is standard.

#### Application:

For severe service requiring a waterproof, steamproof or weatherproof gauge, with the added problem of pulsation and vibration.

<b>STANDARD GAUGE DAMPENER</b> 	Stem Size NPT .....	1/4" (M) - 1/4" (F)
	Approx. Weight Each .....	2 oz.
	Part Number .....	HPP2404-0047

# CONVERSION FACTORS & ENGINEERING DATA

## VOLUME

1 U. S. Gallon	$\left\{ \begin{array}{l} 231. \\ 0.1337 \\ 3.785 \\ .00379 \\ 0.833 \\ .0238 \end{array} \right.$	cu. in.
		cu. ft.
		litres
		cu. meters
		Imp. gal.
42-gal. barrel		
1 Imperial Gallon	1.2	U. S. gal.
1 Cubic Foot	$\left\{ \begin{array}{l} 7.48 \\ 0.0283 \end{array} \right.$	U. S. gal.
		cu. meter
1 Barrel (Oil)	42	U. S. gal.
1 Litre	0.2642	U. S. gal.
1 Cubic Meter	$\left\{ \begin{array}{l} 35,314 \\ 264.2 \end{array} \right.$	cu. ft.
		U. S. gal.
1 Acre Foot	$\left\{ \begin{array}{l} 43,560 \\ 325,829 \end{array} \right.$	cu. ft.
		U. S. gal.
1 Acre Inch	$\left\{ \begin{array}{l} 3,630 \\ 27,100 \end{array} \right.$	cu. ft.
		U. S. gal.

## CAPACITY

1 Cubic Foot Per Second (2d foot) (c.f.s.)	448.83 GPM
1 Acre Foot Per Day	226.3 GPM
1 Acre Inch Per Hour	452.57 GPM
1 Litre Per Second	15.85 GPM
1 Gallon Per Minute	2.65 Litres Per Minute
1 Cubic Meter Per Minute	264.2 GPM
1 Miner's Inch (ID, KS, NE, NM, ND, SD, UT, WA)	9.0 GPM
1 Miner's Inch (CO)	11.7 GPM
1 Miner's Inch (AZ, CA, MT, NV, OR)	11.22 GPM
1,000,000 gal. per day	694.4 GPM

## HEAD

1 Pound Per Square Inch (p.s.i.)	$\left\{ \begin{array}{l} 2.31 \text{ cu. ft. head of water} \\ 2.04 \text{ in. mercury} \\ 0.07 \text{ kg. per sq. cm.} \end{array} \right.$	
1 Foot of Water	$\left\{ \begin{array}{l} 0.443 \text{ lb. per sq. in.} \\ .885 \text{ in. mercury} \end{array} \right.$	
1 Inch of Mercury (or vacuum)	1.132 ft. of water	
1 Kilogram Per Square Cm.	14.22 lb. per sq. in.	
1 Atmosphere (at sea level)	$\left\{ \begin{array}{l} 14.7 \text{ lb. per sq. in.} \\ 34.0 \text{ ft. of water} \\ 10.35 \text{ meters of water} \end{array} \right.$	
1 Meter of Water	3.28 feet of water	

## WEIGHT

1 U. S. Gallon	8.33 lb. = 8 1/3 lbs.
1 Cubic Foot of Water	62.35 lb.
1 Kilogram or Litre	2.2 lb.
1 Imperial Gallon	10.0 lb.

## LENGTH

1 Inch	2.54 centimeters
1 Meter	$\left\{ \begin{array}{l} 3.28 \text{ feet} \\ 39.37 \text{ inches} \end{array} \right.$
1 Rod	16.5 feet
1 Mile	5,280 feet (1.61 kilometers)

## HORSEPOWER

1 H.P.	=	$\left\{ \begin{array}{l} .746 \text{ kilowatts or } 746 \text{ watts} \\ 33,000 \text{ ft. lbs. per minute} \\ 550 \text{ ft. lbs. per second} \end{array} \right.$
H.P. Input	=	$\left\{ \begin{array}{l} \text{Horsepower input to motor} \\ 1.34 \times \text{Kilowatts input to motor} \end{array} \right.$
Run Watts (approx.)	=	$\left\{ \begin{array}{l} \text{Voltage} \times \text{amps} \times \text{motor} \\ \text{efficiency} \times \text{power factor} \\ \text{Kilowatts} = 1000 \text{ Watts} \end{array} \right.$
Water H.P.	=	$\left\{ \begin{array}{l} \text{H.P. required to lift water at a} \\ \text{definite rate to a given distance} \\ \text{assuming } 100\% \text{ efficiency} \\ \text{G.P.M.} \times \text{Total Head (in. ft.)} \\ 3960 \end{array} \right.$
Brake H.P.	=	$\left\{ \begin{array}{l} \text{H.P. delivered by motor} \\ \text{H.P. required by pump} \\ \text{H.P. input} \times \text{motor efficiency} \\ 1.34 \times \text{KW input} \\ \times \text{motor efficiency} \\ \text{Water H.P.} \\ \text{Pump efficiency} \\ \text{G.P.M. times total head (ft.)} \\ 3960 \times \text{pump efficiency} \\ \text{G.P.H.} \times \text{total head (lbs. per sq. in.)} \\ 103,000 \times \text{pump efficiency} \end{array} \right.$

## EFFICIENCY

1 Bar	= 100 KPA
1 Bar	= 14.5 PSI
1 KPA	= .145 PSI
1 PSI	= .703 Meters of Water
1 Meter of Water	= 3.281 Ft. of Head
Efficiency	= $\frac{\text{Power output}}{\text{Power input}}$
Motor Efficiency	= $\frac{\text{H.P. output}}{\text{K.W. input}}$
Pump Efficiency	= $\frac{\text{G.P.M.} \times \text{total head (ft.)}}{3960 \times \text{B.H.P.}}$
Pumping Plant Efficiency	= $\frac{\text{G.P.M.} \times \text{total head (ft.)}}{5300 \times \text{KW input}}$

## AREA

1 Acre	= 43,560 sq. ft.
1 Acre	= 208.75' per side
40 Acre <sup>2</sup>	= 6.33 acres per side

## FLOW

Pounds of Water Per Hour x .002	= Gallons Per Minute
Gallons Per Minute x 500	= Lbs of Water Per Hour
Pounds of Fluid Per Hour Specific Gravity	$\left. \vphantom{\frac{\text{Pounds of Fluid}}{\text{Specific Gravity}}} \right\} \times .002 = 6.33 \text{ Acres Per Side}$
Liters Per Mininute x .264	= Gallons Per Minute (US)
Gallons Per Minute x 3.785	= Liters Per Minute
Cubic Meters Per Hour x 4.4	= Gallons Per Minute (US)
Kilograms of Water Per Minute x .264	= Gallons Per Minute (US)
Gallons Per Minute x 3.8	= Kg of Water per Minute

## PRESSURE

Feet of Water x .433	= PSI
PSI x 2.31	= Feet of Water
Inches Hg x .491	= PSI
Inches Hg x 1.133	= Feet of Water
ATM x 14.7	= PSI
ATM x 33.9	= Feet of Water
Kg/Sq cm x 14.22	= PSI
Meters of Water x 1.42	= PSI
ATM x 760	= mm Hg
mm Hg x .039	= Inches Hg
Bar x 14.5	= PSI
Newton/Meter <sup>2</sup> x 1	= Pascal
PSI x 6.9	= kPa (Kilopascal)
kPa x .145	= PSI

## VOLUME

Lbs. of Water x .119	= Gallons
Gallons (Brit) x 1.2	= Gallon (US)
Gallons x 128	= Fluid Ounces
Cubic Feet x 7.48	= Gallons
Cubic Inches x .00433	= Gallons
Gallons x 3.785	= Liters
Liters x .264	= Gallons
Cubic Meters x 264.2	= Gallons
Cubic Meter x 1000	= Liter
Liters x 1000	= Cubic Centimeters
Cubic Centimeters x 0.338	= Fluid Ounces
Fluid Ounces x 29.57	= Cubic Centimeters

## LENGTH

Mils x .001	= Inches
Meters x 3.281	= Feet
Centimeters x .394	= Inches
Millimeters x .0394	= Inches
Microns x .000394	= Inches

## MASS

Gallons of Water x 8.336	= Pounds
Cubic Feet of Water x 62.4	= Pounds
Ounces x .0625	= Pounds
Kilograms x 2.2	= Pounds
Pounds x .454	= Kilo
Metric Ton x 2205	= Pounds

# SCHEDULE 40 FRICTION LOSS FOR WATER AT 60° F PER 100 FEET OF PIPE

VALUES ARE FOR ESTIMATING PURPOSES ONLY & MAY NOT MEET NEC CODE. DESIGN SHOULD BE VERIFIED WITH A MUNRO REPRESENTATIVE

Pipe Size	3/4"			1"			1-1/4"			1-1/2"		
	U.S. Gallons Per Minute	Head Loss Feet		VEL Ft. Per Sec.	Head Loss Feet		VEL Ft. Per Sec.	Head Loss Feet		VEL Ft. Per Sec.	Head Loss Feet	
		Steel	Plastic		Steel	Plastic		Steel	Plastic		Steel	Plastic
2	1.20	1.93	1.04	0.80	0.60	0.32						
4	2.40	6.94	3.74	1.50	2.14	1.16	0.86	0.56	0.30	0.63	0.20	0.11
6	3.60	14.70	7.95	2.20	4.54	2.45	1.29	0.85	0.46	0.95	0.56	0.31
8	4.80	25.00	13.50	3.00	7.78	4.20	1.72	1.20	0.65	1.26	0.96	0.52
10	6.00	37.80	20.40	3.70	11.70	6.32	2.15	2.04	1.10	1.58	1.45	0.78
12	7.20	53.00	28.60	4.50	16.40	8.86	2.57	3.08	1.66	1.89	2.04	1.10
15	9.00	80.00	43.30	5.60	24.80	13.39	3.17	6.54	3.53	2.37	3.09	1.67
18	10.80	112.00	60.50	6.70	34.70	18.74	3.86	6.72	3.63	2.84	4.31	2.33
20	12.00	136.00	73.50	7.40	42.10	22.73	4.29	9.13	4.93	3.15	5.24	2.83
25				9.30	63.60	34.34	5.36	11.10	5.99	3.80	7.30	3.94
30				11.10	89.20	48.17	6.43	16.80	9.07	4.72	11.00	5.94
35				13.00	119.00	64.26	7.51	23.50	12.69	5.51	14.70	7.94
40				14.90	152.00	82.08	8.58	31.20	16.85	6.30	18.30	9.88
45				16.70	189.00	102.06	9.64	50.20	27.11	7.03	23.20	12.53
50	0.56	0.05	0.02				10.70	60.40	32.62	7.87	23.40	12.64
55	0.62	0.05	0.03				11.80	72.55	39.18	8.66	34.00	18.36
60	0.67	0.06	0.03				12.90	84.70	45.74	9.44	39.60	21.38
65	0.74	0.08	0.04				13.95	99.35	53.65	10.23	45.90	24.79
70	0.78	0.08	0.05				15.00	114.00	61.56	11.02	53.00	28.62
75	0.85	0.10	0.05				16.10	129.00	69.66	11.80	60.00	32.40
80	0.89	0.11	0.06				17.20	144.00	77.76	12.59	68.00	36.72
85	0.96	0.12	0.06				18.25	161.50	87.21	13.38	75.00	40.50
90	1.00	0.13	0.07				19.30	179.00	96.66	14.71	84.00	45.36
95	1.08	0.15	0.08							14.95	93.00	50.22
100	1.11	0.16	0.09							15.74	102.00	55.08
110	1.25	0.21	0.11							17.31	122.00	65.88
120	1.33	0.23	0.12							18.89	143.00	77.22
130	1.47	0.27	0.15	0.83	0.07	0.04				20.46	166.00	89.64
140	1.56	0.30	0.16	0.90	0.08	0.04				22.04	190.00	102.60
150	1.70	0.36	0.19	0.96	0.09	0.05				23.60	218.00	117.72
160	1.78	0.39	0.21	1.03	0.10	0.06				25.20	245.00	132.30
170	1.92	0.45	0.24	1.09	0.11	0.06				26.80	275.00	148.50
180	2.00	0.48	0.26	1.15	0.13	0.07	0.73	0.042	0.02	28.40	305.00	164.70
190	2.16	0.55	0.30	1.22	0.14	0.08	0.77	0.047	0.03			
200	2.22	0.58	0.32	1.28	0.15	0.08	0.81	0.051	0.03			
220	2.44	0.70	0.38	1.41	0.18	0.10	0.89	0.061	0.03			
240	2.67	0.82	0.44	1.54	0.22	0.12	0.98	0.071	0.04			
260	2.89	0.95	0.51	1.67	0.25	0.14	1.06	0.083	0.04			
280	3.11	1.09	0.59	1.80	0.29	0.15	1.14	0.095	0.05	0.78	0.04	0.02
300	3.33	1.24	0.67	1.92	0.32	0.18	1.22	0.108	0.06	0.85	0.05	0.02
320	3.56	1.39	0.75	2.05	0.37	0.20	1.31	0.120	0.06	0.92	0.05	0.03
340	3.78	1.56	0.84	2.18	0.41	0.22	1.39	0.014	0.01	0.99	0.06	0.03
360	4.00	1.73	0.93	2.30	0.45	0.24	1.47	0.150	0.08	1.03	0.07	0.04
380	4.22	1.92	1.04	2.43	0.50	0.27	1.55	0.170	0.09	1.08	0.07	0.04
400	4.44	2.11	1.14	2.57	0.55	0.30	1.63	0.183	0.10	1.14	0.08	0.04
450	5.00	2.62	1.41	2.88	0.69	0.37	1.83	0.228	0.12	1.28	0.09	0.05
500	5.56	3.19	1.72	3.20	0.84	0.45	2.04	0.277	0.15	1.42	0.12	0.06
550	6.11	3.80	2.05	3.52	1.00	0.54	2.24	0.330	0.18	1.56	0.14	0.07
600	6.66	4.46	2.41	3.85	1.17	0.63	2.44	0.388	0.21	1.70	0.16	0.09
650	7.22	5.17	2.79	4.17	1.36	0.73	2.64	0.450	0.24	1.74	0.19	0.10
700	7.78	5.93	3.20	4.49	1.56	0.84	2.85	0.516	0.28	1.99	0.21	0.12
750	8.34	6.74	3.64	4.81	1.77	0.96	3.06	0.590	0.32	2.13	0.24	0.13
800	8.90	7.60	4.10	5.13	1.99	1.07	3.25	0.660	0.36	2.27	0.28	0.15
850	9.45	8.50	4.59	5.45	2.23	1.20	3.47	0.750	0.41	2.41	0.31	0.17
900	10.00	9.44	5.10	5.77	2.48	1.34	3.66	0.821	0.44	2.56	0.34	0.18
950	10.50	10.20	5.51	6.09	2.74	1.48	3.88	0.910	0.49	2.70	0.33	0.18
1000	11.10	11.50	6.21	6.41	3.02	1.63	4.07	0.998	0.54	2.84	0.41	0.22
1100	12.20	13.70	7.40	7.05	3.60	1.94	4.48	1.190	0.64	3.12	0.50	0.27
1200	13.30	16.10	8.69	7.69	4.23	2.28	4.89	1.400	0.76	3.41	0.58	0.31
1300	14.40	18.60	10.04	8.33	4.90	2.65	5.30	1.620	0.87	3.69	0.67	0.36
1400	15.60	21.40	11.56	8.97	5.62	3.03	5.70	1.86	1.00	3.98	0.77	0.42
1500	16.70	24.30	13.12	9.61	6.39	3.45	6.10	2.11	1.14	4.26	0.88	0.47
1600	17.80	27.40	14.80	10.30	7.20	3.89	6.51	2.38	1.29	4.55	0.99	0.53
1800	20.00	34.10	18.41	11.50	8.95	4.83	7.32	2.96	1.60	5.11	1.23	0.66
2000	22.20	41.40	22.36	12.80	10.90	5.89	8.14	3.60	1.94	5.68	1.50	0.81
2200	24.40	49.40	26.68	14.10	13.00	7.02	8.95	4.29	2.32	6.25	1.78	0.96
2400	26.70	58.00	31.32	15.40	15.20	8.21	9.76	5.04	2.72	6.81	2.10	1.13
2500				16.70	17.70	9.56	10.60	5.84	3.15	7.38	2.43	1.31
2800				18.00	20.30	10.96	11.40	6.70	3.62	7.95	2.78	1.50
3000				19.20	23.00	12.42	12.20	7.61	4.11	8.52	3.17	1.71
3200				20.80	26.80	14.47	13.00	8.58	4.63	9.10	3.51	1.90
3500				22.40	30.60	16.52	14.30	10.08	5.44	9.95	4.21	2.27
3800	2.70	0.17	0.09	24.00	34.90	18.85	15.51	13.40	7.24	10.80	4.90	2.65
4200	2.99	0.20	0.11	27.20	44.00	23.76	16.91	14.75	7.97	11.92	5.83	3.15
4500	3.20	0.23	0.12	28.80	48.80	25.35	18.30	16.10	8.69	12.80	6.70	3.62
5000	3.55	0.28	0.15	32.00	59.30	32.02	20.30	19.60	10.58	14.20	8.15	4.40
5500	3.91	0.33	0.18	35.30	70.70	38.18	22.40	23.40	12.64	15.60	9.72	5.25
6000	4.24	0.39	0.21				24.40	27.50	14.85	17.00	11.40	6.16
6500	4.62	0.45	0.24				26.40	31.80	17.17	18.40	13.20	7.13
7000	5.10	0.54	0.29				28.50	36.50	19.71	19.90	15.20	8.21
8000	5.65	0.66	0.36							22.70	19.40	10.48
9000	6.40	0.82	0.44							25.60	24.20	13.07
10000	7.11	1.00	0.54	4.56	0.34	0.18				28.40	29.40	15.88
12000	8.55	1.40	0.76	5.47	0.47	0.26				34.10	41.20	22.25
14000	9.95	1.86	1.00	6.40	0.63	0.34				39.80	54.70	29.54
16000	11.38	2.42	1.31	7.30	0.81	0.44	5.03	0.33	0.18			
18000	12.80	2.98	1.61	8.20	1.00	0.54	5.66	0.41	0.22			
20000				9.12	1.22	0.66	6.30	0.50	0.27			
22000				9.60	1.48	0.80	6.92	0.59	0.32			
24000				10.09	1.73	0.93	7.55	0.69	0.38			
26000				11.42	2.00	1.08	8.18	0.81	0.44	6.02	0.38	0.21
28000				12.75	2.27	1.23	8.80	0.94	0.50	6.48	0.43	0.23
30000							9.44	1.07	0.58	6.94	0.50	0.27
32000							10.07	1.20	0.65	7.40	0.46	0.25
34000							10.70	1.34	0.72	7.86	0.63	0.34
36000							11.32	1.50	0.81	8.33	0.70	0.38
38000							11.95	1.65	0.89	8.80	0.78	0.42
40000							12.57	1.82	0.98	9.25	0.86	0.46
42000							13.20	1.99	1.07	9.72	0.94	0.51
44000										10.18	1.01	0.55
46000										10.63	1.10	0.59
48000										11.10	1.19	0.64
50000										11.58	1.28	0.69
52000										12.01	1.38	0.75
54000										12.49	1.49	0.80
56000										12.93	1.60	0.86

# SCHEDULE 40 FRICTION LOSS FOR WATER AT 60° F PER 100 FEET OF PIPE

VALUES ARE FOR ESTIMATING PURPOSES ONLY & MAY NOT MEET NEC CODE. DESIGN SHOULD BE VERIFIED WITH A MUNRO REPRESENTATIVE

Pipe Size	2"			2-1/2"			3"			4"		
	U.S. Gallons Per Minute	Head Loss Feet		VEL Ft. Per Sec.	Head Loss Feet		VEL Ft. Per Sec.	Head Loss Feet		VEL Ft. Per Sec.	Head Loss Feet	
		Steel	Plastic		Steel	Plastic		Steel	Plastic		Steel	Plastic
2												
4												
6	0.57	0.17	0.09									
8	0.77	0.28	0.15	0.54	0.12	0.06						
10	0.96	0.43	0.23	0.67	0.18	0.10	0.43	0.06	0.03			
12	1.15	0.60	0.33	0.80	0.25	0.14	0.54	0.10	0.05			
15	1.53	1.03	0.56	0.98	0.36	0.19	0.65	0.13	0.07			
18	1.72	1.28	0.69	1.21	0.54	0.29	0.82	0.21	0.11			
20	1.91	1.55	0.84	1.34	0.65	0.35	0.87	0.23	0.12	0.50	0.06	0.03
25	2.55	2.73	1.47	1.63	0.92	0.50	1.09	0.34	0.19	0.64	0.09	0.05
30	2.87	3.29	1.78	2.01	1.39	0.75	1.30	0.48	0.26	0.76	0.13	0.07
35	3.35	4.37	2.36	2.35	1.84	0.99	1.52	0.64	0.35	0.89	0.17	0.09
40	3.82	5.60	3.02	2.68	2.36	1.27	1.74	0.82	0.44	1.01	0.22	0.12
45	4.30	6.96	3.76	3.02	2.93	1.58	1.95	1.02	0.55	1.15	0.28	0.15
50	4.78	8.46	4.57	3.35	3.56	1.92	2.17	1.24	0.67	1.26	0.33	0.18
55	5.26	10.10	5.45	3.69	4.24	2.29	2.39	1.47	0.79	1.41	0.41	0.22
60	5.74	11.90	6.43	4.02	4.99	2.69	2.60	1.74	0.94	1.51	0.46	0.25
65	6.21	13.70	7.40	4.36	5.79	3.13	2.82	2.01	1.09	1.66	0.53	0.29
70	6.69	15.80	8.53	4.69	6.64	3.59	3.04	2.31	1.25	1.76	0.62	0.33
75	7.17	17.90	9.67	5.03	7.55	4.08	3.25	2.52	1.41	1.81	0.73	0.39
80	7.65	20.20	10.91	5.36	8.50	4.59	3.47	2.96	1.60	2.02	0.79	0.43
85	8.13	22.60	12.20	5.70	9.51	5.14	3.69	3.31	1.79	2.17	0.91	0.49
90	8.61	25.10	13.55	6.03	10.60	5.72	3.91	3.67	1.98	2.27	0.98	0.53
95	9.08	27.70	14.96	6.37	11.70	6.32	4.12	4.06	2.19	2.42	1.12	0.60
100	9.56	30.50	16.47	6.70	12.80	6.91	4.34	4.47	2.41	2.52	1.19	0.64
110	10.50	36.40	19.66	7.37	15.30	8.26	4.77	5.33	2.88	2.77	1.42	0.77
120	11.50	42.70	23.06	8.04	18.00	9.72	5.21	6.26	3.38	3.02	1.67	0.90
130	12.40	49.60	26.78	8.71	20.90	11.29	5.64	7.26	3.92	3.28	1.93	1.04
140	13.40	56.90	30.73	9.38	23.90	12.91	6.08	8.32	4.49	3.53	2.22	1.20
150	14.30	64.70	34.94	10.00	27.30	14.74	6.51	9.48	5.12	3.78	2.53	1.37
160	15.30	72.80	39.31	10.70	30.70	16.58	6.94	10.70	5.78	4.03	2.84	1.53
170	16.30	81.40	43.96	11.40	34.30	18.52	7.37	13.30	7.18	4.29	3.18	1.72
180	17.20	90.50	48.87	12.10	38.10	20.57	7.81	13.20	7.13	4.54	3.53	1.91
190	18.20	100.00	54.00	12.70	42.10	22.73	8.63	15.50	8.37	4.79	3.90	2.11
200	19.10	110.00	59.40	13.40	46.30	25.00	8.68	16.10	8.69	5.05	4.29	2.32
220	21.00	131.00	70.74	14.70	55.30	29.86	9.55	19.20	10.37	5.55	5.12	2.76
240	22.90	154.00	83.16	16.10	66.40	35.86	10.40	22.60	12.20	6.05	6.01	3.25
260	24.90	179.00	96.66	17.40	75.30	40.66	11.30	26.20	14.15	6.55	6.97	3.76
280	26.80	205.00	110.70	18.80	86.30	46.60	12.20	30.00	16.20	7.08	8.00	4.32
300	28.70	233.00	125.82	20.10	98.10	52.97	13.00	34.10	18.41	7.57	9.09	4.91
320				20.92	103.00	55.62	13.90	38.40	20.74	8.07	10.20	5.51
340				22.22	116.00	62.64	14.80	43.00	23.22	8.58	11.50	6.21
360		14"		23.53	123.00	66.42	15.60	47.80	25.81	9.08	12.70	6.86
380				24.84	142.00	76.68	16.50	52.80	28.51	9.59	14.10	7.61
400				26.80	167.00	90.18	17.40	58.00	31.32	10.10	15.50	8.37
450	1.04	0.06	0.03	30.20	208.00	112.32	20.40	78.00	42.12	11.49	19.00	10.26
500	1.16	0.07	0.04	33.50	252.00	136.08	21.70	87.70	47.36	12.60	23.40	12.64
550	1.28	0.09	0.05				23.90	105.00	56.70	13.90	27.90	15.07
600	1.40	0.10	0.05				26.00	123.00	66.42	15.10	32.80	17.71
650	1.51	0.12	0.06				28.20	143.00	77.22	16.40	38.00	20.52
700	1.63	0.13	0.07							17.60	43.60	23.54
750	1.75	0.15	0.08							18.90	49.50	26.73
800	1.86	0.17	0.09							20.20	55.80	30.13
850	1.98	0.19	0.10	1.50	0.10	0.05				21.40	62.40	33.70
900	2.09	0.21	0.11	1.58	0.11	0.06				22.70	69.30	37.42
950	2.21	0.23	0.13	1.67	0.12	0.06	1.32	0.07	0.04	24.00	76.60	41.36
1000	2.33	0.26	0.14	1.76	0.13	0.07	1.38	0.07	0.04	25.20	84.30	45.52
1100	2.56	0.31	0.17	1.93	0.16	0.09	1.52	0.09	0.05	27.70	101.00	54.54
1200	2.79	0.36	0.19	2.11	0.18	0.10	1.66	0.10	0.05			
1300	3.02	0.42	0.22	2.29	0.21	0.11	1.80	0.12	0.06			
1400	3.26	0.48	0.26	2.46	0.24	0.13	1.94	0.14	0.07			
1500	3.49	0.54	0.29	2.63	0.27	0.15	2.08	0.15	0.08			
1600	3.72	0.61	0.33	2.81	0.31	0.17	2.21	0.17	0.09			
1800	4.19	0.76	0.41	3.16	0.38	0.21	2.49	0.22	0.12	2.00	0.13	0.07
2000	4.65	0.92	0.50	3.51	0.47	0.25	2.77	0.26	0.14	2.22	0.15	0.08
2200	5.23	1.16	0.63	3.95	0.60	0.32	3.12	0.33	0.18	2.50	0.19	0.10
2400	5.81	1.40	0.76	4.37	0.68	0.37	3.40	0.39	0.21	2.73	0.22	0.12
2600	6.10	1.54	0.83	4.82	0.83	0.45	3.59	0.43	0.23	2.88	0.25	0.13
2800	6.54	1.75	0.95	5.05	0.91	0.49	3.87	0.49	0.26	2.61	0.28	0.15
3000	6.98	1.96	1.06	5.27	0.99	0.53	4.15	0.55	0.30	3.33	0.32	0.17
3200	7.57	2.28	1.23	5.71	1.15	0.62	4.50	0.64	0.35	3.61	0.38	0.20
3500	8.15	2.60	1.40	6.15	1.31	0.71	4.85	0.74	0.40	3.89	0.43	0.23
3800	8.74	2.98	1.61	6.59	1.50	0.81	5.20	0.84	0.45	4.17	0.49	0.26
4200	9.62	3.56	1.92	7.47	1.88	1.02	5.72	1.00	0.54	4.59	0.59	0.32
4500	10.50	4.13	2.23	7.91	2.09	1.13	6.23	1.17	0.63	5.00	0.69	0.37
5000	11.60	5.03	2.72	8.79	2.54	1.37	6.92	1.37	0.77	5.55	0.83	0.45
5500	12.80	6.04	3.26	9.65	3.05	1.65	7.61	1.71	0.92	6.11	1.00	0.54
6000	14.00	7.05	3.81	10.50	3.56	1.92	8.31	1.99	1.07	6.67	1.17	0.63
6500	15.15	8.22	4.44	11.40	4.14	2.24	9.01	2.32	1.25	7.22	1.36	0.73
7000	16.30	9.38	5.07	12.30	4.73	2.55	9.70	2.65	1.43	7.78	1.55	0.84
8000	18.60	12.00	6.48	14.10	6.06	3.27	11.10	3.39	1.83	8.89	1.98	1.07
9000	20.90	14.90	8.05	15.80	7.53	4.07	12.50	4.22	2.28	9.99	2.49	1.34
10000	23.30	18.10	9.77	17.60	9.15	4.94	14.08	5.12	2.76	11.10	3.00	1.62
12000	27.90	25.40	13.72	21.10	12.80	6.91	16.60	7.18	3.88	13.30	4.20	2.27
14000	32.60	33.80	18.25	24.60	17.10	9.23	19.40	9.55	5.16	15.50	5.59	3.02
16000	37.20	43.30	23.38	28.10	21.80	11.77	22.10	12.20	6.59	17.80	7.15	3.86
18000				31.60	27.10	14.63	24.90	15.20	8.21	20.00	8.90	4.81
20000				35.10	33.00	17.82	27.70	18.50	9.99	22.20	10.80	5.83
22000				38.70	39.30	21.22	30.30	22.00	11.88	24.40	12.90	6.97
24000				42.20	46.20	24.95	33.20	25.90	13.99	26.70	15.10	8.15
26000				45.70	53.60	28.94	36.00	30.00	16.20	28.90	17.60	9.50
28000				49.20	61.50	33.21	38.80	34.40	18.58	31.10	20.10	10.85
30000							41.50	39.10	21.11	33.30	22.90	12.37
32000							44.30	44.10	23.81	35.60	25.80	13.93
34000							47.10	49.40	26.68	37.80	28.90	15.61
36000							49.90	54.80	29.59	40.00	32.10	17.33
38000							52.60	60.60	32.72	42.20	35.40	19.12
40000							55.40	66.60	35.96	44.50	39.00	21.06
42000							58.20	72.90	39.37	47.25	43.75	23.62
44000							61.00	79.40	42.88	49.70	47.90	25.87
46000							63.70	86.30	46.60	51.15	50.90	27.49
48000										51.33	54.90	29.65
50000										55.50	58.90	31.81
52000										58.25	64.45	34.80
54000		</										

# RECOMMENDED MATERIALS

Rigid Material		Flexible Material	
A	Aluminum	B	Buna N
B	Brass	N	Neoprene
D	Ductile Iron	T	Teflon
S	Stainless Steel	V	Viton
C	Carbon Steel	E	Ethylene Propylenediene M-Class Rubber
P	Polypropylene	S	Styrene Butadiene Rubber
N	Nylon	R	Rubber Natural
---	----	U	Ultra High Molecular Weight Polyethylene

*Teflon® is a registered trademark of Dupont*

These recommendations are based upon careful examination of available published information and are believed to be accurate. However, since the resistance of metals, plastics and elastomers can be affected by concentration, temperature, presence of other chemicals and other factors, this information should be considered as a general guide rather than an unqualified guarantee. Ultimately, the customer must determine the suitability.

All recommendations assume ambient temperatures unless otherwise noted.

The ratings for these materials are based upon the chemical resistance only. Added consideration must be given when the chemical is abrasive, viscous in nature, or has a Specific Gravity greater than 1.1.

Media	Rigid Material	Flexible Material	Media	Rigid Material	Flexible Material	Media	Rigid Material	Flexible Material
Acetic Acid	ASP	ETU	Bromic Acid	P	VE	Cyclohexane	ABDSCN	V
Acetic Anhydride	ASP	BNTU	Burnt Limt (CA O)	ABDSCPN	B	Detergents	ASPN	BNVERU
Acetone	ADSCPN	ETU	Butadiene	ABDS	BNTV	Developer Solution	P	B
Acetylene-dry	ASDN	BNVEU	Butane	ABDSN	BTV	Dextrose	ASN	BE
Agricultural Lime Solutions	DSCPN	B	Butenes	ABDSC	V	Diesel Fuels	ABDSCN	BV
Air	ABDSN	BNTVESPU	Butyl Acetate-Dry	ABDC	TE	Deithylene Glycol	ABDSCP	BNV
Alcohol - Amyl	BDSCPN	BNTVE	Butyle Stearate	ABS	BU	Disodium Phosphate	P	BESRU
Alcohol - Butyl	ABDSPN	BNTVE	Butylene	ABDSC	BTV	Dowtherm	C	VS
Alcohol - Thyl	BDSCPN	V	Cadium Cyanide	P	B	Ethanol		NTESRU
Alcohol - Isopropyl	ADSCPN	NV	Calcium Acetate	BSP	EU	Ethanolamine	ADS	N
Alcohol - Methyl	BDSCPN	NTE	Calcium Bisulfite	EPN	BNTVSRU	Ether	ABSN	BT
Alum	S	BRU	Calcium Chloride	PN	BTVESRU	Ethyl Acetate	DSN	ETR
Aluminum Chloride	P	BNTVESRU	Calcium Hydroxide	BDSCPN	BNTVESRU	Ethyl Chloride-Dry	ABS	BTR
Aluminum Floride, 20%	ABDCP	BNTVESRU	Calcium Hypochlorite	P	BTVEU	Ethylene	BDS	TVU
Aluminum Nitrate	SP	BERU	Calcium Nitrate, 40%	ADSP	BSRU	Ethylene Dichloride-Dry	BDSC	TVU
Aluminum Potassium Sulfate	ASCP	BNTVEU	Carbolic Acid (Phenol)	S	TVEU	Ethylene Glycol	ABDSPN	BNTVESRU
Aluminum Sulfate	ASCP	BNTVER	Carbon Dioxide-Dry	ABDSN	BESRU	Ethylene Oxide	ASN	T
Ammonia-Gas or Liquid	DCPN	NTEU	Carbon Disulfide	DSN	TV	Fatty Acids	SPN	NTVU
Ammonium Chloride - Dry	DPN	BNTVESRU	Carbon Tetrachloride - Dry	DSN	TV	Ferric Chloride	BP	NTVESRU
Ammonium Hydroxide	DSPN	NTEU	Carbonated Beverages	ASNP	BNV	Ferric Hydroxide	PN	BNTVER
Ammonium Nitrate	ASP	BNTESRU	Carbonic Acid	ASNP	BNTVES	Ferric Nitrate	SP	BNTVES
Ammonium Phosphate	SPN	BNTVES	Castor Oil	SPN	BESRU	Ferric Sulfate	SP	BNTVESRU
Mono-Basic	SCPN	BNTV	Caustic Potash (KOH)	DPN	ERU	Flourboric Acid	SP	BNTVERU
DI Basic or Tri-Basic	SPN	BNTV	Caustic Soda (NA OH)	DPN	ERU	Formaldehyde, 40%	BSP	NTESRU
Ammonium Sulfate	DP	BNTERU	“Cellosolves”			Formalin	ASP	N
Aniline	ADSCP	E	Butyl or Ethyl	ABDSC	TU	Formic Acid	SP	NTEU
Anti-Freeze		NTVESRU	Methyl	ABDSC	BU	Freon	ADCN	NTE
Arsenic Acid	SP	BESU	Chlorobromomethane	BS	V	Fruit Juices-Grapefruit	SNP	BNV
Asphalt	SPN	V	Chloroform-Dry	ABN	N	Lemon	SNP	BNV
Barium Chloride	BSDP	BNTVESRU	“Chlorox” Bleach	BN	N	Pineapple	SNP	BNV
Barium Hydroxide	DSPN	BNTVESR	Chromic Acid, 50%	DSP	TV	Furfural	ABDS	NTEU
Barium Sulfide	SPN	BNTVERU	Citric Acid	SP	NTVESRU	Gasoline-Refined	ABDSCN	BTVU
Basic Slag	P	B	Cobaltized Super Compound	P	B	Gasoline-Sour	ASN	BTV
Beer	ABS	NTVESRU	Copper Chloride-Dry	DCP	BNTVESU	Gelatin	ASPN	BTVESRU
Benzene/Benzol	ABDSN	TV	Copper Sulfate	SP	BNTESU	Glucose	ASPN	BTVESRU
Benzine	ABDSCN	B	Copperized Super Compound	P	B	Glue	ABDCPN	BNTVERU
Black Liquor (Paper Ind.)	P	VESRU	Corn Oil	SPN	BU	Glycerin	ABDSCPN	BNTVESRU
Bleach (12.5 Chloride)	P	VEU	Cottonseed Oil	ASPN	BU	Glycols	PN	BNTVESRU
Borax	CSPN	NTVESU	Crude Oil		NTY	Green Liquors (Paper Ind.)	CP	VU
Boric Acid	ASNP	BNTVE	Cresote	ABDSC	VU	Hexane	ABDSCN	BTVU
Brine	SPN	BESRU	Cresylic Acid	BDSC	TV	Hydrobromic Acid	P	TVEU

# RECOMMENDED MATERIALS

Media	Rigid Material	Flexible Material	Media	Rigid Material	Flexible Material	Media	Rigid Material	Flexible Material
Hydrochloric Acid	P	TVEU	Oil-Hydraulic	ABDSCPN	B	Sodium Sulfate	BSDN	BNTVESRU
Hydrocyanic Acid, 50%	ASP	TVEU	Oil-Petroleum Crude	DSCN	BU	Sodium Sulfide	SCP	NTVESRU
Hydrofluoric Acid, 48%	E	TV	Oil-Petroleum Refined	ABDSCN	BU	Sodium Thiosulfate	SCPN	BNTVESRU
Hydrogen Gas	ABDS	BTU	Oil-Transmission	BDSCPN	V	Soybean Oil	CPN	BU
Hydrogen Peroxide	SP	TVEU	Oil-Vegetable	ABN	BNTV	Stannic Chloride	P	TVSRU
Hydrogen Sulfate	S	T	Oleic Acid	DSCN	BTSU	Stannous Chloride, 15%-Dry	D	TSRU
"Hypo"	S	B	Oleum	DC	TV	Steam 400°F	DS	V
Hypochlorous Acid, 20%	S	VRU	Oxalic Acid	AP	TVERU	Stearic Acid	SPN	BTU
Isobutyl Acetate	ABSCPN	EU	Oxygen	ABDS	BNTVERU	Stoddard Solvent	ABDSCN	BTU
Isopropyl Acetate	CSP	EU	Palmitic Acid	SP	BTVSU	Styrene	ASC	TV
Jet Fuel	ABDSCN	TVU	Paraffin	ABDSCPN	BNTV	Sugar Liquors		
Kerosene	ABDSC	BTU	Pentachlorophenol-Dru	C	T	Cane	ABDSCPN	BNTVRU
Lacquers	ASN	BTEU	Perchloroethylene	DSN	TV	Beet	ADSCPN	BNTVRU
Lactic Acid, 20%	SPN	NTE	Phosphoric Acid	SP	TVER	Sulfate Liquors	P	BNTVRU
Lactic Acid, 50%	SP	NT	Photographic Solutions	SPN	V	Sulphite Liquors	SP	V
Lard	ASPN	BNVU	Phthalic Anhydride	ABDSC	NTVE	Sulfuric Acid	P	TVU
Lead Chloride Sulfate	P	BNVS	Picric Acid			Sulfurous Acid	SP	TVRU
Lime Slurry	EPN	B	Molten	S	T	Superphosphate	P	B
Lime Sulfur	DSPN	BVE	Aqueous Solution	SP	T	Tannic Acid, 10%	SP	NTVE
Linoleic Acid	EP	S	Plating Solutions	P	E	Tar-Wood	ABDSCP	B
Linseed Oil	SP	BTU	Potassium Acetate	BDSPN	BETV	Tartaric Acid	SPN	NTVERU
L.P.G.	ABDSN	BN	Potassium Chloride	PN	BNTVESRU	Titanium Tetrachloride-Dry	SCPN	TV
Magnesium Carbonate	BDSCP	BNTVESRU	Potassium Cyanide	SCPN	BNTESRU	Toluene/Toluol	ABDSCN	T
Magnesium Chloride	SNP	BNTVESRU	Potassium Dichromate	ABDSCN	BNTEU	Tetrachloroethylene	SN	TV
Magnesium Hydroxide	BDSCPN	TVRU	Potassium Fluoride	ABDSCPN		Trichloroethylene-Dry	BDSCNP	TV
Magnesium Nitrate	ASPN	BNTVESRU	Potassium Hydroxide, 30%	SPN	NTERU	Triethanolamine	ADSP	BVE
Magnesium Sulfate	SPN	BSRU	Potassium Nitrate	ABDSP	BNTESRU	Trisodium Phosphate	SCPN	BNTVSRU
Meat and Bone Meal	APN	B	Potassium Sulfate	ABSP	BNTVESRU	Urea	ASPN	BNTVE
Mercuric Chloride	PN	BNTVERU	Propionic Acid	SPN	N	Urine	SPN	BNVE
Mercury	DSCPN	BNTVESRU	Propylene Glycol	ABDPN	BTVSRU	Varnish	ASPN	TV
Methane	ACEN	BU	Propylene Oxide	SCN	TE	Vinegar	SPN	NTVEU
Methanol	ABDSCPN	BNTE	Rosi	ASPN	B	Water		
Methyl Amyl Acetate	P	EU	Salt Water	BSPN	BTVESRU	Acid Mine	SNP	BV
Methylene Chloride	SN	TVU	Shellac	ASPN	BT	Deionized	PN	N
Methyl Benzene	ABDSCN	VU	Silicone Fluid	SN	BEVE	Demineralized	PN	N
Methylenthyl Keton	ABDSC	E	Silicone Oil	SPN	NU	Distilled	ASPN	BNTVE
Milk	SNP	BNVE	Silver Nitrate	PN	NTVESRU	Fresh	ABSPN	BTVE
Mineral Oil	ABDSCPN	BNTV	Soap Solutions	CSPN	BTVSRU	Salt	BSPN	BVERU
Molasses	ABDSCPN	BNV	Soda Ash	DSCPN	BNTVESRU	White Liquor (Paper Ind.)	S	BNTVSRU
Muriate of Potash (K CL)	DPN	B	Sodium Bicarbonate	ABSPN	BNTVESRU	Wine	SN	N
Muriatic Acid (H CL)	P	TV	Sodium Bisulfate	SP	BNTESRU	Xylene/Xylol	ABSCN	TV
Naptha	ABSNP	TVU	Sodium Borate	BSPN	BNTVESRU	Zinc Chloride	NP	BNTVEU
Napthalene	ABDSC	TVU	Sodium Carbonate	DSCPN	BNTVESRU	Zinc Nitrate, Sulfate	ASPN	BNTVE
Napthenic Acid	BDSC	BU	Sodium Chloride	DSPN	BNTVESRU			
Natural Gas	ADSN	B	Sodium Cyanide, 10%	DSCP	BNTVESRU			
Nickel Chloride	SPN	BNTVESRU	Sodium Dichromate, 10%	ASCP	TEU			
Nickel Sulfate	SPN	BNTVESRU	Sodium Hydroxide, 40%	DSP	NTE			
Nitric Acid	S	TV	Sodium Hypochlorite, 20%	NP	TVU			
Nitrobenzene	DSCN	TU	Sodium Metaphosphate	DSN	BTVESRU			
Nitro Lime	P	B	Sodium Nitrate	ADSCPN	TEU			
Octane	ABDSCN	VU	Sodium Peroxide	DSP	TVE			
Oil-Core	BDSCN	B	Sodium Phosphate	BDSCP	BTVERU			
Oil-Fuel	ABDSCN	B	Sodium Silicate	ABDSPN	BNTVESRU			

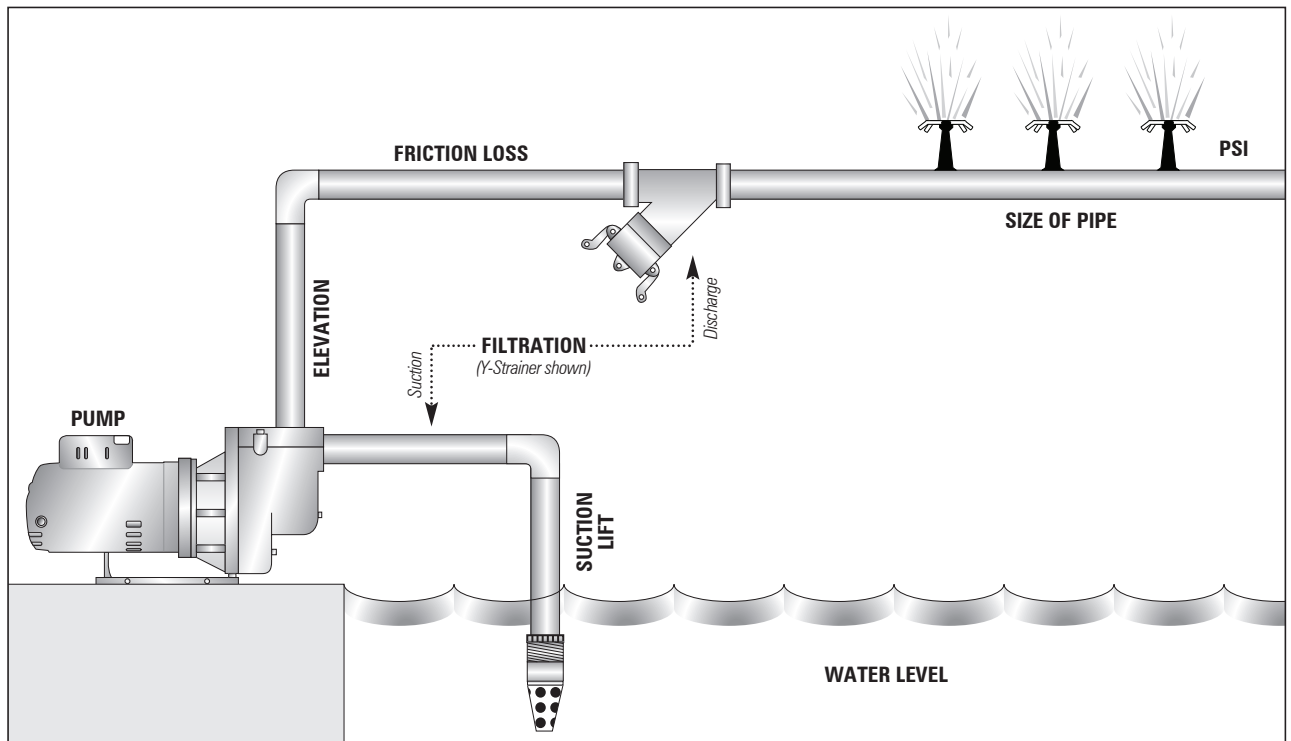
  

Material	Temperature °F
Polypropylene	120
Nylon	200
Buna N	180
Neoprene	275
Teflon	400
Viton	400
EPDM	300
SBR	
Rubber Natural	250
Polyethylene	



# PUMP DATA WORKSHEET

<b>GPM</b>	<b>PUMPING REQUIREMENTS</b> To size a pump, first figure total gallage needed. (For example: Irrigation system, household usage, etc.) _____ GPM	
TOTAL DYNAMIC HEAD (TDH)	<b>ELEVATION</b> A. Suction Lift To determine suction lift, measure the distance between the water level and the pump inlet. (Total measurement in feet) _____ FEET	
	+	B. Elevation Change To figure elevation, measure the distance from the pump inlet to the highest point in the system. (Total measurement in feet) _____ FEET
	+	<b>FRICITION LOSS</b> To estimate friction loss, first determine the size of pipe used. Refer to friction loss chart on pages 2 and 3. (Total measurement in feet) _____ FEET
	+	<b>PSI - POUNDS PER SQUARE INCH</b> Determine the pressure <b>required</b> at the end of the line of the largest zone. Convert to head in feet using the following equation. $PSI \times 2.31 = HEAD \text{ IN FEET}$ _____ FEET
	=	<b>TOTAL DYNAMIC HEAD (TDH)</b> Total the sum of elevation, friction loss and PSI. This total equals TDH in feet. _____ TDH
<b>MISC.</b>	<b>ELECTRICAL</b> VOLTAGE: <input type="checkbox"/> 110 Volt <input type="checkbox"/> 220 V PHASE: <input type="checkbox"/> Single Phase <input type="checkbox"/> 3 Phase	<b>FILTRATION</b> <input type="checkbox"/> Suction <input type="checkbox"/> Discharge
	<b>POWER SUPPLY</b> <input type="checkbox"/> Engine-driven <input type="checkbox"/> Gas	
<b>H2O</b>	<b>WATER SUPPLY</b> <input type="checkbox"/> Suction from Pond <input type="checkbox"/> Pump in Well <input type="checkbox"/> Flooded Suction <input type="checkbox"/> Irrigation Ditch	



PHONE: 800-933-1290 • FAX: 970-261-1368  
 E-MAIL: [MSI@munrocompanies.com](mailto:MSI@munrocompanies.com)  
 WEBSITE: [www.munrosupplyinc.com](http://www.munrosupplyinc.com)

## MUNRO PRODUCTS

Basket Strainers	75
Complete Pro	1
Dewatering Pumps	27, 34-36
Foot Valves	80
FS Series Dewatering Pumps	35
Hose	47-50
Hose Kit Assemblies	47-50
Irrigation Pumps	1-4
Jet Pumps	14
Package Systems	1, 44, 45
Professional LP Series Pumps	2
Puddle Pro	27
Pump Enclosure	1
Pump Hat	80
Pump Lawn Controller	1, 82, 83
Pump Panels	82, 83, 85
Pump Start Relay	82
PVC Foot Valve	80
QDX Stainless Steel	
Dewatering Pumps	27, 34-36
Residential Series, Irrigation	2
RP Series Dewatering Pumps	34
Screens	74, 75
Self-Priming High &	
Medium Head Pumps	1-5, 11
Self-Priming Work Horse	3
Shallow Well Jet Pumps	14
Simplicity 70VFD	45
SmartBOX	83
StandAlone	44
StartBOX	82
StartBOX (plus)	82
Start Relay, Pump	82, 83
Submersible Sump Pumps	26, 27
Suction Hose Kit Assemblies	46, 47
Superflex 40 Hose	47
Versatile Centrifugal Pumps	5-9
Water Feature Pumps	34-36
Y-Strainers	74, 75

## ALPHABETICAL PRODUCT LISTINGS

### A

Abrasion-Resistant Hose	51
Adapters & Couplers	54-60
Adapters, Pitless	88
Aerators	37
Agriculture Pumps	7-9, 11
Agricultural Hose	51, 53
Air Conditioner Pumps	42
Air Hose	50
Air Hose Fittings	59
Air Operated Diaphragm Pumps	39
Air Water System Tanks	91
Alarms	28, 86
Aluminum Cam Fittings	54-57
Aluminum Foot Valves	80
Arrestors, Lightning	81
Arrestors, Torque	89
Automatic Sump Pumps	26-28
Automatic Water System Pumps	14, 16, 43, 44

### B

Ball Check Valves	76
Ball Valves, Brass	79
Ball Valves, Bolted	79
Ball Valves, Full Port	79
Ball Valves, Poly	79
Ball Valves, PVC	79
Ball Valves, Stainless Steel	79
Ball Valves, Three-Way	79
Banding Tools	61
Basin Covers	92
Basins	92
Basket Strainers	75
Battery-Operated Pumps	36, 43
Bauer Hose Couplings	59
Bearing/Seal Assemblies	41
Bell Reducers	65

Belt Driven Pumps	5
Black Steel Pipe Fittings	62-67
Bleeder Orifices	89
Bolt Clamps	61
Booster Pumps, Pressure	6
Brass Ball Valves	79
Brass Cam Fittings	54-57
Brass Check Valves	76, 77
Brass Imported Foot Valves	80
Brass Pipe Fittings	62-67
Break Away Pump Fitting	33
Bug Free Vents	92
Bulk Material Delivery Hose	51
Bushings	64
Butterfly Valves	73

### C

Cable Guards	89
Cable Ties, Nylon	88
Cam Adapters	57
Cam Couplers	54-57
Cam Gaskets	57
Cam and Groove Couplings	54-57
Cam Handles	57
Caps	67
Caps, Well	89
Cast Iron Foot Valves	80
Cast Iron Hubs	92
Cast Iron Threaded Flanges	71
Center Punch Tools	61
Centrifugal Pumps	5-9
Check Valves	76, 77
Check Valve with Strainer	80
Chemical Hose	53
Circulator Pumps	40, 41
Cistern Pumps	42
Clamps	61
Clamping Tools	61
Clear Braid Hose	51
Collapsible Discharge Hoses	48, 49

Collapsible Discharge Hose	
Pre-Assembled	48, 49
Commercial Fuel Hose	53
Complete Pro	1
Contractor Garden Hose	50
Control Accessories	84, 86, 87
Control Boxes	25, 82, 83, 85
Controls, Liquid Level	78, 86, 87
Control Panels	28, 85
Cooler Pumps	42
Cords, Power Supply	81
Corrugated Drop Hose	53
Couplers	67
Couplers & Adapters	54-60
Couplings, Garden Hose Thread	60
Cross	67
Crow Foot Couplings	59
Crude Oil Hose	53
Current Transformers	81
Custom-Build Engine Driven Pumps	12

## D

Dam Box	83
Delay, Timer	84
Dewatering Pumps	27, 34-36
DG Sumptrol Float Switch	87
Diaphragm Pumps	39, 42, 43
Discharge Check Valve	77
Discharge Hose	48-53
Domestic Water Pumps	14-24
Double Bolt Clamps	61
Drain Cocks	93
Drop Hose	53
Drop Pipe & Couplings, PVC	88
Dry Powder Delivery Hose	51
Ductile Iron Cam Fittings	54-57
Duplex Pumps	42
Dust Caps & Dust Plugs	56

## E

Effluent Pumps	28
Elbows 90°	66
Elbows 90° Street	66
Elbows 45°	66
Elbows 45° Street	66
Enclosures, Nema 3	87
Engine Driven Self Priming Pumps	10-13
Evaporative Cooler Pumps	42

## F

FDA Food Transfer Hose	51
Fertilizer Hose	51
Fiber Gasket (Full Face)	71
Fire Hose Fittings	70
Fire Hose Nozzles	70
Flanged Gate Valves	72
Flanges	71
Flange Bolt Pack & Gasket	71
Flat Corrugated Drop Hose	53
Flexible Coupling Driven Pumps	5
Flexible Entry Boot	92
Float Controls	86, 87
Float Control Valves	78
Float Control Weights	86
Float Switch Accessories	87
Float Switches	86, 87
Float Valves	78
Flow Meter	38
Flow Sleeves	23
Food Grade Cam Fittings	54-57
Food Grade Suction Hose	51
Foot Valves	80
Fountains	37
Frame Mounted Pumps	5
Franklin Single Phase Control Boxes	25
Fuel Flow Meter	38
Fuel Hose	53
Fuel Oils Hose	53
Fuel Transfer Pumps	38

Full Lug Butterfly Valve	73
--------------------------	----

## G

Galvanized Pipe Fittings	62-67
Garden Hose	50
Garden Hose Fittings	60
Garden Hose Nozzles	60
Gaskets	57, 59, 69-71
Gate Valves	72
Gauges, Pressure	90, 94
Gauge, Dampner/Standard	94
Globe Style Silent Check Valves	76
Grinder Pumps	29
Grinder Pump Controls	28
Grinder Pump Stand	29
Grooved Fittings	68, 69

## H

Handles	57
Heat Resistant Hose	51
Heavy Duty Oil Transfer Hose	53
Heavy Hose (Yellow MSHA)	48
Hand Pump Primers	77
High Head Self-Priming, Pump	1-4
High Head Utility Pump	6
High Pressure Pumps	2, 6, 11, 16-24, 43
Horizontal Discharge Pumps	33
Hose	46-53
Hose Adapters	54-60
Hose Barb Fittings	60
Hose Fittings	54-60
Hose Kit Assemblies	46-50, 52, 78
Hose Menders	58
Hose Nipples	58
Hose Nozzles	60, 70
Hose Thread Couplings	60
Hot Air Blower Hose	51
Hubs	92
Hydraulic Motor Driven Pumps	42

Hypro Pumps ..... 42

## I

Industrial Hose ..... 51

Insecticide Hose ..... 51

Irrigation Pumps ..... 1-11

Irrigation Pump Accessory Kits ..... 78

## J

Jet Pumps ..... 14, 15

## K

King Nipples ..... 58

## L

Laundry Tray Basin ..... 92

Lawn Pumps ..... 1-4, 6

Lightning Arrestor ..... 81

Liquid Level Controls ..... 78, 86, 87

Liquid Transfer Pumps ..... 10

## M

Marine Hose ..... 51

Mechanical Groove Fittings ..... 68, 69

Mill Hose ..... 49

Mining Hose ..... 48, 51

Motor Driven Centrifugal Pumps ..... 6-9

Motor Protection ..... 81, 89

MSHA Hose ..... 48

Multi-Stage Submersible Pumps ..... 16-24

## N

Nema Enclosures ..... 87

Nozzles ..... 60, 69, 70

Nyglass Cam Fittings ..... 54-57

## O

Oilfield Suction Hose ..... 52

Out of Pond Pumps ..... 38

## P

Package Systems ..... 1, 14, 16, 30, 44, 45

Paddle Pumps ..... 43

Pedestal Sump Pumps ..... 26

Petroleum Product Hose ..... 52, 53

Pin Lug Sets ..... 59

Pipe Fittings ..... 62-67

Pipe Nipples ..... 62, 63

Piston Pumps ..... 42

Plastic Foot Valve ..... 80

Plugs ..... 66

Plug Valve ..... 72

Plunger Pumps ..... 42

Poly Ball Valves ..... 79

Poly Glass Cam Fittings ..... 54-57

Poly Glass 90° Cam Couplers ..... 56

Polyethylene Basin With Steel Cover ..... 92

Pond Pumps ..... 34-38

Power Supply Cord ..... 81

Pressure Booster Pumps ..... 6

Pressure Gauges ..... 94

Pressure Gauge Dampener ..... 94

Pressure Sensor ..... 83, 84

Pressure Switches ..... 84

Puddle Pro ..... 27

Pump Accessory Kits ..... 78

Pump Cable ..... 81, 88

Pump Enclosure ..... 1

Pump Hat ..... 80

Pump Panels ..... 82, 83, 85

Pump Primers ..... 77

Pump Savers ..... 81, 89

Pump Stands ..... 90

Pump Start Relay ..... 82, 83

Punch Lock Clamps ..... 61

PVC Ball Valves ..... 79

PVC Check Valves ..... 76

PVC Cam Couplers & Adapters ..... 56

PVC Float Valve ..... 78

PVC Hose ..... 47, 48

## Q

Quick Open Gate Valve ..... 72

## R

Relief Valves ..... 90, 93

Remote Switches ..... 84, 86, 87

Roller Pumps ..... 42

Rubber Gaskets ..... 71

Rubber Hose (Discharge) ..... 49, 50

Rubber Suction Hose ..... 46

## S

Screens ..... 74, 75

Seals, Well ..... 89

Self-Cleaning Strainers ..... 74

Self Priming High Head Pumps ..... 1-4, 11

Septic Hose ..... 53

Sewage Pumps ..... 28-33

Sewage System Packages ..... 30

Shallow Well Jet Pumps ..... 14, 15

Simplicity 70VFD ..... 45

Sink Tray System ..... 92

Spray Hose ..... 51

SO Wire ..... 81

Solenoid Valves ..... 69

Solids Handling Pumps ..... 28-33

Splice Kits ..... 88

Stainless Steel Ball Valves ..... 79

Stainless Steel Cam Fittings ..... 54-57

Stainless Steel Pipe Fittings ..... 62-67

Stand Alone ..... 44

Start Relay, Pump	.82, 83
Steam Hose	.51
Strainers	.74, 75
Static Test Pump	.11
Straight Centrifugal Pumps	.5-9
Strainer & Check Valve Assembly	.80
Submersible Aerators	.37
Submersible Constant Pressure Systems	.16
Submersible Dewatering	.27, 34-36
Submersible Effluent Pumps	.28
Submersible Motors	.25
Submersible Pump Cable	.88
Submersible Pump Ends	.25
Submersible Pump Flow Sleeve	.23
Submersible Sump Pumps	.26, 27
Submersible Wastewater Pumps	.28-33
Submersible Well Pumps	.16-24
Suction Hose	.46, 47
Suction Hose Assembly Kits	.46, 47
Sump Pumps, Submersible	.26, 27
Swedge Nipples	.63
Switches, Float	.86, 87
Switches, Pressure	.84
Switches, Remote	.84, 86, 87

## T

Tank, Controlled Air Water System	.91
Tank Fitting Packages	.90
Tank Tees	.90
Tank Truck Hose	.53
Tank Packages	.14
T-Bolt Clamps	.61
Tees	.67
Temperature Sensor	.83, 84
Threaded Butterfly Valve	.73
Threaded Flanges	.71
Timer Delay	.84
T-Line Strainers & Replacement Screens	.75
Torque Arrestors	.89
Trash Pumps	.12, 13

Two-Pole Liquid Level Switch	.87
Two-Stage Pumps	.6
Turf Pumps	.4, 7-9, 11

## U

Underground Wire	.88
Unions	.67
Unloader Valves	.93
Uniseals	.92
Universal Driven Pumps	.5
Utility Pump	.6

## V

Valves, Ball	.76, 79
Valves, Brass Ball	.79
Valves, Brass Check	.76, 77
Valves, Butterfly	.73
Valves, Check	.76, 77
Valves, Discharge	.77
Valves, Discharge Check	.77
Valves, Flanged	.72
Valves, Float	.78
Valves, Foot	.80
Valves, Gate	.72
Valves, Poly Ball	.79
Valves, PVC Ball	.79
Valves, PVC Check	.76
Valves, Relief	.90, 93
Valves, Stainless Steel Ball	.79
Valves, Solenoid	.69
Valves, Swing Check	.76
Valves, Three-Way	.79
Valves, Unloader	.93
Valves, Wafer Check	.76, 77
Vents	.92

## W

Wafer Butterfly Valve	.73
Wafer Style Check Valves	.76, 77
Waste Water Pumps	.28-33
Water & Air Hose	.50
Water Feature Protection	.83
Water Feature Pumps	.34-38
Water System Pumps, Automatic	.14, 16, 43, 44
Water Truck Accessories	.5, 69, 73
Well Caps	.89
Well Pumps	.16-24
Well Seals	.89
Whip Check	.59
Wire, SO	.81

## Y

Y-Strainers	.74, 75
-------------	---------



***Check With Munro For Your Hydraulic Hose Needs and Crimped Hose Through 10"***

**MUNRO SUPPLY INC.**  
735 South 9th Street  
Grand Junction, CO 81501

***Toll Free: 1.800.933.1290***

**Phone: 970.242.6810 • Fax: 970.241.1368**

**Visit us on the Web: [www.munrosupplyinc.com](http://www.munrosupplyinc.com)**

