OPERATING CHARACTERISTICS FLANGED GATE, GLOBE, AND CHECKS

FLOW COEFFICIENTS

Flow coefficients are the same for both carbon steel and stainless steel bodies. Refer to main catalog for valve size offerings.

GATE VALVE Cv's

							CLASS	6 150							
SIZE	SIZE 2" 2-1/2" 3" 4" 6" 8" 10" 12" 14" 16" 18" 20" 24" Cv 298 466 694 1 234 2 873 5 109 8 622 12 416 17 651 23 055 30 603 37 782 57 349														
SIZE Z Z-1/Z S 4 6 6 10 12 14 16 18 20 24 Cv 298 466 694 1,234 2,873 5,109 8,622 12,416 17,651 23,055 30,603 37,782 57,349															
							CLASS	300	\sim						
SIZE	2"	2-1/2"	3"	4"	6"	8"	10"	12"							
Cv	289	452	672	1 194	2 776	4 935	7 982	11 929							

GLOBE	E VALVE	E Cv's		1	NILA	4 4 1	-	
				CLASS 1	50	AA	Ĺ	i
SIZE	2"	2-1/2"	3"	4"	6"	8"	10"	12"
Cv	46	72	105	166	400	810	1,310	1,900
				CLASS 30	00			
SIZE	2"	2-1/2"	3"	4"	6"	8"	10"	
Cv	46	84	104	165	436	692	1,120	

SWI	NG	CHEC	k va	LVE	Cv's							
						CLA	SS 150					
SIZE	2"	2-1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
Cv	218		499	903	2,032	3,679	5,857	8,435	11,708	15,293	19,754	24,912
						CLA	SS 300					
SIZE	2"	2-1/2"	3"	4"	6"	8"	10"	12"				
Cv	211	330	482	858	1,963	3,549	5,546	8,128				

Cv is the volume of water in U.S. gallons per minute that passes through the valve at a pressure drop of 1 PSI at 68°F. Cv is in imperial units; in metric units, the same coefficient (often called the Flow Factor) is Kv and corresponds to the flow rate of water in cubic meters (m^3) per hour at a pressure drop of 100kPa (1 bar) at 20°C.

OPERATING CHARACTERISTICS GATE, GLOBE, AND CHECK VALVES

FLOW COEFFICIENTS

The approximate corresponding formulas for flow are:

$$\mathbf{Q} = \mathbf{C}\mathbf{v} \times \sqrt{\frac{\triangle \mathbf{P} \times \mathbf{62.4}}{\mathbf{D}}}$$

Where:

- Q = Valve flow rate in gallons per minute (USGPM)
- △P = Pounds per square inch (PSI) pressure drop across the valve
- 62.4 = Conversion factor for fluids computed in relation to water
- D = Density of fluids in pounds per cubic foot

$$\mathbf{Q} = \mathbf{K}\mathbf{v} \times \sqrt{\frac{\triangle \mathbf{P} \times 1000}{\mathbf{D}}}$$

Where:

- Q = Valve flow rate in cubic meters per hour (m³/h)
- $\triangle P$ = pressure drop across the valve in Bar
- 1000 = Conversion factor for fluids computed in relation to water
- D = Density of fluids in kilograms per cubic meter (kg/m³)

The relationship between Cv and Kv, expressed in the above mentioned unit of measure, is as follows:

$$Kv = \frac{Cv}{1.16}$$

	ANSI B16.	5 - 1/16 Raise	d Face Mate wi	th 125# Cast Ir	on Flanges - AN	SI B16.1	
Çir.o.	Flange	Flange	Bolt Circle	Bolt Hole	Number of	Diameter	Length of
3120	Diameter	Thickness	Diameter	Diameter	Bolts	of Bolts	Stud Bolts
2	6	5/8	4 3/4	3/4	4	5/8	3 1/4
2 1/2	7	11/16	5 1/2	3/4	4	5/8	3 1/2
3	7 1/2	3/4	6	3/4	4	5/8	3 3/4
3 1/2	8 1/2	13/16	7	3/4	8	5/8	3 3/4
4	9	15/16	7 1/2	3/4	8	5/8	3 3/4
5	10	15/16	8 1/2	7/8	8	3/4	4
6	11	1	9 1/2	7/8	8	3/4	4
8	13 1/2	1 1/8	11 3/4	7/8	8	3/4	4 1/4
10	16	1 3/16	14 1/4	1	12	7/8	4 3/4
12	19	1 1/4	17	1	12	7/8	4 3/4
14	21	1 3/8	18 3/4	1 1/8	12	1	5 1/4
16	23 1/2	1 7/16	21 1/4	1 1/8	16	1	5 1/2
18	25	1 9/16	22 3/4	1 1/4	16	1 1/8	6
20	27 1/2	1 11/16	25	1 1/4	20	1 1/8	6 1/4
24	32	17/8	29 1/2	1 3/8	20	1 1/4	7

CLASS 150#

CLASS 300#

	ANSI B16.5	5 - 1/16 Raise	d Face Mate wi	th 250# Cast Ir	on Flanges - AN	SI B16.1	
Size	Flange Diameter	Flange Thickness	Bolt Circle Diameter	Bolt Hole Diameter	Number of Bolts	Diameter of Bolts	Length of Stud Bolts
2	6 1/2	7/8	5	3/4	8	5/8	3 1/2
2 1/2	7 1/2	1	5 7/8	7/8	8	3/4	4
3	8 1/4	1 1/8	6 5/8	7/8	8	3/4	4 1/4
3 1/2	9	1 3/16	7 1/4	7/8	8	3/4	4 1/2
4	10	1 1/4	7 7/8	7/8	8	3/4	4 1/2
5	11	1 3/8	91/4	7/8	8	3/4	4 3/4
6	12 1/2	1 7/16	10 5/8	7/8	12	3/4	5
8	15	1 5/8	13	1	12	7/8	5 1/2
10	17 1/2	1 7/8	151/4	1 1/8	16	1	6 1/4
12	20 1/2	2	17 3/4	1 1/4	16	1 1/8	6 3/4
14	23	2 1/8	20 1/4	1 1/4	20	1 1/8	7
16	25 1/2	2 1/4	22 1/2	1 3/8	20	1 1/4	7 1/2
18	28	2 3/8	24 3/4	1 3/8	24	1 1/4	7 3/4
20	30 1/2	2 1/2	27	1 3/8	24	1 1/4	8 1/4
24	36	2 3/4	32	1 5/8	24	1 1/2	91/4

	CONVER	RSION FROM IN	CHES TO MILLIM	ETERES			CONVERSION	ROM FRACTION	IAL INCHES TO N	AILLIMETERS	
in.	min	in.	mm	in.	nim	iu.		mm	in.		mm
1	25.4	36	914.4	71	1803.4	1/64	0.016	0.397	33/64	0.516	13.097
2	50.8	37	939.8	72	1828.8	1/32	0.031	0.794	17/32	0.531	13.494
3	76.2	38	965.2	73	1854.2	3/64	0.047	1.191	35/64	0.547	13.891
4	101.6	39	990.6	74	1879.6	1/16	0.063	1.588	9/16	0.563	14.288
5	127.0	40	1016.0	75	1905.0	5/64	0.078	1.984	37/64	0.578	14.684
6	152.4	41	1041.4	76	1930.4	3/32	0.094	2.381	19/32	0.594	15.081
7	177.8	42	1066.8	77	1955.8	7/64	0.109	2.778	39/64	0.609	15.478
8	203.2	43	1092.2	78	1981.2	1/8	0.125	3.175	5/8	0.625	15.875
9	228.6	44	1117.6	79	2006.6	9/64	0.141	3.572	41/64	0.641	16.272
10	254.0	45	1143.0	80	2032.0	5/32	0.156	3.969	21/32	0.656	16.669
11	279.4	46	1168.4	81	2057.4	11/64	0.172	4.366	43/64	0.672	17.066
12	304.8	47	1193.8	82	2082.8	3/16	0.188	4.763	11/16	0.688	17.463
13	330.2	48	1219.2	83	2108.2	13/64	0.203	5.159	45/64	0.703	17.859
14	355.6	49	1244.6	84	2133.6	7/32	0.219	5.556	23/32	0.719	18.256
15	381.0	50	1270.0	85	2159.0	15/64	0.234	5.953	47/64	0.734	18.653
16	406.4	51	1295.4	86	2184.4	1/4	0.250	6.350	3/4	0.750	19.050
17	431.8	52	1320.8	87	2209.8	17/64	0.266	6.747	49/64	0.766	19.447
18	457.2	53	1346.2	88	2235.2	9/32	0.281	7.144	25/32	0.781	19.844
19	482.6	54	1371.6	89	2260.6	19/64	0.297	7.541	51/64	0.797	20.241
20	508.0	55	1397.0	90	2286.0	5/16	0.313	7.938	13/16	0.813	20.638
									110		
21	533.4	56	1422.4	91	2311.4	21/64	0.328	8.334	53/64	0.828	21.034
22	558.8	57	1447.8	92	2336.8	11/32	0.344	8.731	27/32	0.844	21.431
23	584.2	58	1473.2	93	2362.2	23/64	0.359	9.128	55/64	0.859	21.828
24	609.6	59	1498.6	94	2387.6	3/8	0.375	9.525	7/8	0.875	22.225
25	635.0	60	1524.0	95	2413.0	25/64	0.391	9.922	57/64	0.891	22.622
						100					
26	660.4	61	1549.4	96	2438.4	13/32	0.406	10.319	29/32	0.906	23.019
27	685.8	62	1574.8	97	2463.8	27/64	0.422	10.716	59/64	0.922	23.416
28	711.2	63	1600.2	98	2489.2	7/16	0.438	11.113	15/16	0.938	23.813
29	736.6	64	1625.6	99	2514.6	29/64	0.453	11.509	61/64	0.953	24.209
30	762.0	65	1651.0	100	2540.0	15/32	0.469	11.906	31/32	0.969	24.606
31	787.4	66	1676.4			31/64	0.484	12.303	63/64	0.984	25.003
32	812.8	67	1701.8			1/2	0.500	12.700	1	1.000	25.400
33	838.2	68	1727.2								
34	863.6	69	1752.6						1		
35	889.0	70	1778.0								

METRIC EQUIVALENTS

Temperature Conversions $F^\circ = C^\circ x \ 1.8 + 32$ $C^\circ = (F - 32) / 1.8$



DOG REWISSINGER LINE STOT

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The BNW form is constituted book as the distribution of states in the BNW

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	Aluminum	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin	EPDM/EPR	Viton	Hypalon	Neoprene	Nylon	Grafoil	Teflon
Acetaldehyde	B	(((A		A	A	A	D	A	B	(D	D	B		A
Acetamine	B	B	B	B	B				A	A				B	B			A
Acetate Solvents	A	B	A	B	A			A	A	D	D		D	D	D	D		A
Acetic Acid, derated	B		D	D R	A	A	Δ	A	A	$\frac{1}{c}$					$\frac{1}{c}$	B	A	A
Acetic Acid, crude	Č	Č	č	č	Â	A	Â	B	A	D	D		D		Ď	B	A	A
Acetic Acid, glacial						A			A	D		В	C	C	C	В	A	A
Acetic Acid, pure	((D	D	A	A	A	D	A	D	D		D	A	D	B	A	A
Acetic Acid, 10%			C		A	A	A	B	A	D	B	B	D		C	B	A	A
Acetic Acid, 60%			L.	<u>ر</u>	A D		R	B C	A A	D	U	, c	U U	U U		R	A A	A
Acetic Anhydride	B	D	D	D	B	B	B	B	Ā	D	C	C	D	В	C		Ā	Ā
Acetone	Ā	A	A	Ā	Ā	Ā	A	A	A	D	A	A	D	D	D	A	A	A
Other Ketones	A	A	A	A	A	A	A	A	A	D	A	D	D	D	D			A
Acetyl Chloride	D	A		D				B	A	D	D	D	D	D	D			A
Acetylene Acid Fumes	R	D D	A D	A D	R	A	R	A	A	6	A D	A	A		R	A		A A
Acrylonite	B	Ā	A	Ċ	A		B	A	A	D	D	D	C	D	D	A		Ā
Air	A	A	Α	A	A		A	A	Α	A	A	Α	A	A	A	A		A
Alcohol, Amyl	B	B	B	(A		B	B	B	(A	A	B	B	(A	A	A
Alcohol, Butyl	B	B	B	C C	A		A	A	A	B	A	C	A	B	B	A	A	A
Alcohol, Diacetone	R	R	R	R	R		A	B	A	Δ	A	B A		B		A A	A A	A
Alcohols, Fatty	B	B	B	B	A		Â	–	A	B	Â	^	^	B	B	Â	Ā	Ā
Alcohol, Isopropyl	B	B	B	B	B		A	В	B	(A	Α	A	В	В	A	A	A
Alcohol, Methyl	B	B	B	B	A		A	A	A	B	A	Α	(A	A	A	A	A
Alcohol, Propyl	A	A	В	B	A	1	A	A	A	B	A	A	A	В	B	A	A	A
Aluminum Acetate	A		-	n	Δ	R	R	6	A	A	A	A	D	D	A	A		A
Aluminum Chloride dry	B	B	C	D	(D	B	B	B	A	A	A	B	B	A	A	A
Aluminum Chloride solution	(D	C	B	В	A	B	D		A	В	В	A	A	A
Aluminum Fluoride	(D	D	((B	A	A	(Α	A	В	A			A
Aluminum Hydroxide		A	D	D	A	В	B	B	B	A		A	A	D	A			A
Aluminum Nitrate	R	<u>ب</u>		U	ι		В	R	Б К	В	U	В	U	В	В			A
Alum (Aluminum Potassium	–	<u> </u>					^		~					<u> </u>				^
Sulfate)	D	D		D	B	C	В	(A	B	D		В	В	B		A	A
Alum (Aluminum Sulfate)	((D	D	B	A	B	(A	A	D	A	A	B	A	A	A	A
Amines	B	B	B	(A	A	A	B	B	D		(D	D	D	B		A
Ammonia, Alum			•	R	A	Λ	A	R	A	B		R	- n	R	B C		A A	A
Ammonia, Annyaroos Elquia	B	۲Ď	Â	Ā	Â	<u>^</u>	Â	B	B	B	D		A	B	B	B	Ā	Ā
Ammonia, Gas, hot	A	D		B	A		A	В	B	(D	Α	D	C	A		A	A
Ammonia Liquor					A		A		B				_			B	A	A
Ammonia Solutions			В	B	A		A	B	B	B	D	B	D	D	B	B	A	A
Ammonium Ricarbonate	B	B	(B	R		R	R	D	B	Δ	A A	Δ	R	Δ	R		A A
Ammonium Bromide 5%	Ď	t "	È	L	B		B	B		- ⁵	Â		<u> </u>	L _	- î	L		Ā
Ammonium Carbonate	B	B	В	B	B		B	B		(D	A	B	B	A			A
Ammonium Chloride	D	D	D	D	((B	B	B	B	(A	A	A	A	D		A
Ammonium Hydroxide 28%					B	A	A		B	B	D	B	A		A	B	A	A
Ammonium Monosulfate		<u>۳</u>	· ·	<u>۲</u>	D	A A	A	B	B	B		D	A	A	A		A	A
Ammonium Nitrate	B	D	D	D	A	Â	B	D	B	A	D	Ā	A	A	A	C		A
Ammonium Oxiate 5%	A				A		A	B			A							A
Ammonium Persulfate	C	(A		A	D		D	D	B	B	B	C			A
Ammonium Phosphate			D	D D	R		B		R	A		A	A A	A	A A	A		A A
Ammonium Phosphate Tri-basic	(Ċ	D	p	B		B	Ċ	B	A	A		A		A	A		A
Ammonium Sulfate	t	t	Ţ,	D	B	B	B	B	B	A	B	A	B	B	A	Â	A	A
Ammonium Sulfide	(D	D	D	B		B	B		A	A	A	D	B	B			A
Ammonium Sulfite	((((A		B	D		B	A	B	A		Å			Â
Amyi Aceiate	R	R	<u>ر</u>	R	Б Л	A	A	R	A R	D D	A A	ß	0	D N	U C	R		Å
Aniline	C	D	(C C	B		A	B	B	D	D	(Ċ	D	D	B	A	A
Aniline Dyes	Ċ	(Ċ	Ċ	A		A	A		C	A	(B	C	(A
Apple Juice	B	(D	D	B		A	A		A	A	B	A	B	A			A
Aqua Regia (Strong Acid)	D			D	B		B	P		D		D	D	D	D		D	A
Aromanic Solvents	Å	A	L C	6	A		A	ь р		יין	A	Ű		A	ч ^и 1			A

				ron	B									C	ON	IPA	IBI	LITY
	Aluminum	Brass	Carbon Steel	Ductile Iron/Cast	316 Stainless Ste	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin	EPDM/EPR	Viton	Hypalon	Neoprene	Nylon	Grafoil	Teflon
Arsenic Acid	D	D	D	D	B		B	D	B	A	D	B	A	B	A		A	A
Asphalt Emulsion		A	B	B	A		A A	A	A		A	D	A	D	(A		A A
Aspiran Liquid Barium Carbonate	$\frac{1}{c}$	R	B	R	R		R	R	A A	B	A A	A	A A	۵ ک	Δ			Δ
Barium Chloride	Đ	B	Č	Č	B	В	Č	B		A	A	A	A	B	Â			Â
Barium Cyanide	D	((B		B	D		B	A	B	B	B	B			A
Barium Hydrate	D				A		A	B			A							<u>A</u>
Barium Nitrate	R	<u> </u>	<u>ر</u>	B	<u>Б</u>	A	<u>A</u>	Б		<u>A</u>	A 	D D	A	ß	<u>R</u>	A		A
Barium Sulfate	Đ	- C	7	(A		Â	B		A	Ā	B	A	В	Ā			Â
Barium Sulfide	D	D	(D	B		B	(A	A	A	A	B	B	B		A
Beer Poot Sugar Liguors	A	B	D	D	A	A	A	A		B	A	B	A	(B	A		<u>A</u>
Benzaldehyde	A	A	A	□ (A		A	B	B	D	A	A	D	D	D	A A		A A
Benzene (Benzol)	B	B	B	B	B	B	A	Ā	B	D	(D	B	D	D	A	A	A
Benzoic Acid	B	B	D	D	B	A	B	B	A	(A	D	B	D	(D		A
Berryllium Sultate	B	R		В	ß		R	B	٨	B	A	R	B	B	B N	n		A A
Blood (Meat Juices)	B	B		D	A	A	A	B	A	B	A	B	B	B	B	U		A
Borax (Sodium Borate)	(D	((A			A	A	B	A	Α	A	В	D			A
Bordeaux Mixture					A		A		P		A							A
Borax Liquors Boric Acid	R	A C			B		B	A B	Δ	B	A A	B	A A	B	B	D	Δ	<u>Α</u>
Brake Fluid	B	B		B	B	A		B	^	D	B	B	D	B	(A
Brines, saturated	(B	D	(B		B	B	A	A	A	A	A	B	B	(A
Bromine, dry Bunker Oik (Fuel)		B	D	D	D		B	A	A	D	D	D	B	D	D	D	В	A
Butadiene	B	Ċ	B	B	A		A	((B	C	A	(B	D	(D
Butane	A	A	B	В	A		A	B	A	B	A	D	A	A	B	A		A
Butter Buttermilk				n	A		A	D		B	A	P	٨	D	B			A
Butyl Acetate	B	B		B	B		A	B	В	D	B	D	D	D	D			A
Butylene	Ā	Ā	A	Ā	Ā		A	A		D	A	D	D	D	D	A		A
Butyric Acid	B	(D	D	B		B	B	A	(A	((((D		A
Calcium Bisulfite			D	D	B		B	B	B	A A	D A	B	A	B	A A	Δ		Α Δ
Calcium Chlorate	B	D		(B		B	B		B	D	B	B	B	B	~	В	A
Calcium Chloride	(B	((B	B	B	B	A	A	A	B	A	B	A	D		A
Calcium Hydroxide	D R			(B		B	A	A	A	A	A R	A	B	B	A		A A
Calcium Phosphate	D	C		(B		B			B	B	B	B	B	B			Ā
Calcium Silicate	D	((B		B	_		B	A	B	B	B	B			A
Calcium Sultate	R		R	C	R R	В	B	В	B	A	A	B	A	B	A			A A
Camphor	(C		(B		Ĉ	(B	A	B	B	B	B			Ā
Cane Sugar Liquors	A	B		B	A		A	B		B	A	B	B	(B			A
Carbonated Beverages	B	B	D	B	B	B	B			B	A	B	B	D	B		A	A
Carbon Bisulfide	A	Ċ	B	B	B		B	B		D	A	D	A	D	D		A	A
Carbon Dioxide, Dry	A	A	A	B	A	A	A	A		(A	B	B	B	B		A	A
Carbonic Acid	A		D	D	B	B	A	B	Λ	B	A	B	A	B	B	Λ	A	A A
Carbon Tetrachloride, dry	B	ĉ	B	Č	A	Ā	A	A	A	D	Â	D	B	D	D	A	A	Ā
Carbon Tetrachloride, wet		D	D	D	B		B	B	B	D	B	D	B	D	D	A	A	A
Casein Caster Ail			B	R	Δ B		B A	L	Δ	Δ B	A A	B	Δ B	B	B	Δ		<u>Α</u>
Caustic Potash	<u>^</u>	Ê			Ā		Ā	B	<u>^</u>	B	D			B	B			Ā
Caustic Soda	D	_	B	B	A		A	A		(D	B	B	B				A
Cellulose Acetate Ching Wood Oil (Tung)	R	B	ſ	ß	R		٨	B	R	D	L A	B	D	D	DR	Δ		A A
Chlorinated Solvents	Đ	Ċ	Č	Č	Â		Ă	B	^	Ď	Å	D	ĉ	D	D			Å
Chlorinated Water	(D	(D	A	D	D	B	D		A	B	A	D	B	A
Chlorobenzene, dry	B	R	B	B	B B	L.	A A	A R	A B		B	D	B A		D	0	A	A A
Chloroform, dry	D	B	B	Č	Å	B	A	Å	B	Ď	Å	D	B	D	D	B		Â
Chlorophyll, dry	B	B		B	B		A	B		B		B	B	B	B			A
Chrome Alum	ß		B	B	B B		B A	B	A	B	B	B	B	B	B	D		Α Δ
Chromic Acid < 50%	č	Ď	D	D	((B	, C	B	D	D	((B	D	D		A
Chromic Acid > 50%	D	D	D	((D	B	D	B	D	D	((B	D	D		A
Chromium Sultate Cider	B			υ	₿ B		R	B A		R	C A	ß	В	B	ß			A A
Citric Acid	B	C	D	D	B	C	A	B	A	B	Ă	B	A	Å	A	B	A	A
Citrus Juices	(B	D	D	B		A	A		A	A		A	D	A			A
Coconut Oil	R	R	((A		A A	R		B	A A		B	U	B			A A
	, a	L "	L `	<u>`</u>			4				^				,			~

	Aluminum	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin	EPDM/EPR	Viton	Hypalon	Neoprene	Nylon	Grafoil	, Teflon
Loffee Coffee Extracto het	A	A			A		A	B		A	A				A			<u> </u>
Colice Extracts, nor	A		<u>ا</u>		A		A	A			A		D	-				A
Cooking Ail	A D		D		A A		Å	D A		L A		D D	D A	1 c		<u> </u>		A
Conner Acetate	h n		h h	D N	A		A	A C	R	A C	A D	B	A D		C C	 		Å
Copper Acelule		- ^v	- ^v		Α Δ		Å	<u> </u>			Å			-	<u> </u>			A
Copper Conide				D	Δ		Â	C		Å	Â	B	B	B	Δ	 		<u>^</u>
Copper Nitrate	1 D	Ď	D	D	B		B	Ď		A	Â	B	A		A			A
Conner Sulfate	1 Ď	1 Ď	1 Ď	Ď	B	B	B	Č	A	Å	Â	Ā	Â	A	Ä	A	A	Ā
Corn Oil	B	B	C	C	B		B	B		A	A	C	A	C	C			A
Cottonseed Oil	B	B	(C	B		B	B		A	A	(B	C	B			A
Cresol					B		B			D	D	D	D	D	D			A
Cresote Oil	В	В	B	B	B	В	A	B	В	(D	D	A	D	D			A
Cresylic Acid	(((D	B		B	B		D	D	D	B	D	D			A
Crude Oil, sour	B		B	(A		A	B		A	A	D	A	C	B			A
Crude Uil, sweet	A	B	B	B	A		A	A		A	A		A		В			A
Cupric Nitrate			- D	D D	A		A	U U			D A				D	 		A
Cunnide Plating Solution			P		R		R			R		R	R	R	D R			A
	Δ		Δ	Δ	Δ		Δ	R	R	C	Δ	D	Δ	D D	D	Δ		Δ
Cyclohexanore	B	B	⊢^−	L^	Â		Â	B	B	D	Â		- ^	-	D	Â		Â
Detergents, synthetic	B	B		B	B		A	B	-	B	A	В	A	B	B	<u> </u>		A
Dextrin	B	B		B	B		B	B	1	В	A	В	B	В	B			A
Dichloroethane				((В	В		D	D	D			D			A
Dichloroethyl Ether	B	B		B	B		B	/		D	D	D	D	D	D			A
Diesel Oil Fuels	A	A	A	A	A		A	A		A	A	D	A	D		<u> </u>		A
Diethylamine	В	в	A	в	A		A	В		B	A		U	ι		в		A
Diethylene Gyrol	R	R	<u> </u>				D A	R				D A	R	R				A
Diethyl Sulfate	B	B		B	B		B	B		<u> </u>	Δ	í (B	D	r C			Δ
Dimethyl Formamide	B	B		B	A		A	B		B	A	D	D	D	D			A
Dimethyl Phthalate						1				В	C		D	В	В			A
Dioxane	В	B		B	В		В	B		D	C	(D	D	D		A	A
Dipentane (Pinene)	A	A		A	A		A			В	A	D	В	D	D			A
Disodium Phosphate	В				В		B	C		В	A		B	B	В			A
Dowtherm	A	A	B	B	A		A	A		D	A	D	A	D	D	(A	A
Drilling Mud	B B	B	B	B	A	_	A	B		A	A	A	A	В				A
Dry Cleaning Fluids	A	H	B C	D D	A R		A	B			A		В		D P			A
Engme	<u> </u>		- [•]	–	0		D	D D		R		D			B			Δ
Epsom Salts (MaSo4)	A	B	C	C	В		В	В		Ă	Â		A	D	Ă	B		A
Ethane	A	В	C	C	В		В	В		A	A	D	A		В			A
Ethers	A	B	A	B	A	B	A	B		D	C	((D	D			A
Ethyl Acetate	A	(В	(B	A	В	B	В	D	((D	D	D	A		A
Ethyl Acrylate	C	B	(C	A		A	B	A	D	B	(D	D	D	A		A
Ethyl Benzene					D		A	_	A	C	A	D	D	_	D	В		A
Ethyl Bromide	B D	A	- D	D D	Б	٨		D D	D	В	A	В	D D		B C			A P
Ethyl Chloride, wet	n b			n b	R	A	R	R	R		A	R	R					Δ Λ
Ethylene Chloride		L,	<u>۴</u>	<u> </u>	Å		Å	B	B	D	Å		D		Ā	<u> </u>		A
Ethylene Dichloride	L,				B		A	B	-	D	ĉ	D	D	D	D	A	A	A
Ethylene Gylcol	A	B	B	B	B	A	A	B	A	A	A	A	A	В	B	A		A
Ethylene Oxide	((B	B	В		В	В	A	D	A	D	D	D	D	D		A
Ethyl Ether	B	B		(A		A	A	В	D	A	D	D	D	D			A
Ethyl Silicate	A	B		B	B		B	B		B	A	B	B	В	C			A
Ethyl Sulfate	в	$\vdash $			B		B	D		B	A		A		B	<u>ــــــــــــــــــــــــــــــــــــ</u>	Δ.	A
Ferric Hydroxide	P P	<u>۲</u>	<u>۲</u>	<u> </u>	A		A		A	R		U	A	U U	D	A .	A	A
Ferric Nitrate	D	D	D	D	ĉ	В	Â	Ô	В	A	Â	A	A	В	A			Ā
Ferric Sulfate	D	D	D	D	B	B	A	D	-	A	A	A	A	Ā	A	C		A
Ferrous Ammonium Citrate	B				B		B				A							Å
Ferrous Chloride	D	B	D	D	D		D	D	D	A	A	A	A	B	A	(A	Å
Ferrous Sulfate	(B	D	D	B		B	B	B	A	A	A	A	B	A		A	A
Ferrous Sultate, Saturated	C	L C	<u>(</u>	C	A		A	B	В	C	A	B	В	B	C			A
Fertilizer Solutions	B B		B	В	В		B	B		R R		n			B	I		A
Fish Oils	H	R	D D	R	A		A	R		A (A C	D D	A (R	r r			A A
Flughoric Acid	R			•	B		A A			A A	- D	U	· ·	R	R			Å
Fluorosilicic Acid	Ď	B	D	D	B		B	A	B	Ĉ	Č	((Č	Č			A
Formaldehyde, cold	Å	Â	Ă	B	Å	A	Å	A	B	B	Å	B	D	Ċ	Ċ	A		Å
Formaldehyde, hot	B	B	D	D	(B	B	B	B	A			B	B			A
Formic Acid, cold	D	B	D	D	B	B	A	B	A	D	D		B	(B	A	A	A
Formic Acid, hot	D	B	D	D	B	D	B	B	B	D	D		A		A	D	A	A
Freen Gas, dry	B	B	B	ß	A	A	A	A	B	C C	A A			B		A	A	A
Freen 12 13 22 114 115	D A	D A		R	A A		A A	R	D R	R	A A		D D	R		A A	A A	
11001112, 13, 32, 114, 113		A .			А		Α.	U U		U	м	м	v		A	A .	A	

				ron	-									C	ON	IPA 1	IBI	LITY
	Aluminum	Brass	Carbon Steel	Ductile Iron/Cast	316 Stainless Stee	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin	EPDM/EPR	Viton	Hypalon	Neoprene	Nylon	Grafoil	Teflon
Freon 21, 31	B	B		(A		A	B	B	D	A	D	D		D	A	A	
Freen 122	A	A		B	٨		A	D	B	D	A	D	D		B	A	A	
Freon. wet	D	D		D	Ĉ	B	B	B	B	B	Å	B	D	B	B	D	A	A
Fruit Juices	B	B	Ð	D	A	-	Ā	B	-	A	A	A	Ā	(Ā			A
Fuel Oil	A	B	B	B	A		A	B		A	A	D	A	((A
Fundric Acid	- <u>^</u>				Δ.	D	<u>A</u>	D	D	B	A	6			<u> </u>			A
Galic Acid 5%	Â	Γ	D D	D	B		B	B	B	B	Ā	Ċ	A	-	B	A		Ā
Gas, Manufactured	B	B	B	B	B		B	A		A	A		A		A	A		A
Gas, Natural	B	B	B	B	A		B	A		A	A	D	A	B	A	A		A
Gasoline Aviation	A A	A	δ Δ	B	Δ		A A	Δ Δ	Δ	B (A A		A A		D	Α	Δ	A A
Gasoline, Leaded	Â	Â	Ā	A	A		Â	B	Ā	Ċ	A		Ā	B	D	Â	Ā	Ā
Gasoline, Motor	A	A	A	B		A	A	A	A	(A	D	A	D	D	A	A	A
Gasoline, Refined	A	B	B	B	A		A	B	A	(A	D	A	D	(A	A	A
Gasoline, Sour	A A	Δ	Δ	B	Δ		A A		A A		Δ	U	A A	B	D	Δ	A	A A
Gelatin	A	A	D	D	A		A	B	<u>^</u>	A	A	A	A	B	A	Â	~	Ā
Glucose	A	A	B	B	A		A	A	A	A	A	A	A	B	A	A		A
Glue Glycerine (Glycerol)	A	B	A	B	B	Λ	A	B	A	A	A	B	A	B	A	A		A
Glycol Amine	Ĉ	D	,	B	B	A	^		D	A	(D	D	(^	A	
Gycol	A	B	(B	B		A	B		B	(A	A	B	A			A
Graphite	B	B	٨	C	B		A	B		B	A	B	B	B	B			A
Helium Gas	B	B	A	B	A		A	B	A	B	A	B	B	B	B			A
Heptane	A	A	B	B	A		A	B	A	A	A	D	A	B	B			A
Hexane Hexanel Tertigry	A	B	B	B	A		A	B	A	A	A	D	A	B	(A		A
Hydrolic Oil, Petroleum Base	A	B	A	B	A		A	A	A	A	A	D	A	·	B	A		A
Hydrazine	(D		D	B		B	D		(D	В	D	((A
Hydrocyanic Acid	A	D	D		A		A		B	B	D	B	A	B	B		A	A
Hydrogen Gas, cold	A	B	B	B	A		A	A		B	A	B	A	B	B	A	A	A
Hydrogen Gas, hot	(-	B	-	B		A		A	B	A	B			B			A
Hydrogen Peroxide, Concentrated	A	D	D	D	B		B	D	D	D	D	B	B	B	D	D		A
Hydrogen Feloxide, Dilule	A	$\frac{1}{c}$	B	B	A	B	B	B	B	A C	C	A	A	В	A	D	A	A
Hydrogen Sulfide, Wet	B	D	(D	B	-	B	(D	((B	A	B	B	D	A	A
Hypo (Sodium Thiosulfate)	B	(D	(B		B	B		A	A	A	A	0	A			A
Incomparing Gas	A	A	A D	A D	A A		A A	A R		Δ	A A	B	A	B	B	Δ		A
Iodoform	Ċ	Ċ	B	(A		A	(A	-	A		-			A
Iso-Butane					B		B			B	A	D			D			A
Iso-Uctane	A	A	A	В	A R		A A	A		A	A A	D	A	В			Δ	A
Isopropyl Ether	B	A	A	B	A		Â	B	A	Č	Â	D	D	D	(A	Â	Â
J P-4 Fuel	A	A	A	B	A		A	A	A	A	A		A		(A		A
J P-5 Fuel	A A		A	A	A		A	A A	A	B	A A		A			A		A
Kerosene	Â	Â	B	B	Â		Â	Ā	Â	A	Â	D	Ā	D	Ċ	Ā	A	Ā
Ketchup	D	D	D	D	A		A	B		A	A		A	B	A			A
Ketones	A	A A	A	A	A		A	A		D	A	D	D	D	D			A
Lactic Acid Concentrated cold	ĉ	D	D	D	Ā	D	Â	D	A	B	D	B	A	B	A	A	A	Ā
Lactic Acid Concentrated hot	(D	D	D	B	D	A	D	B	(D	B	B	B	(A	A
Lactic Acid Dilute cold	A R		D	D	A A	R R	A A		A	B	D	R	A	В	A D		A	Δ
Lactose	B	B		Č	B		B	B		B	A	B	B	B	Č		<u>^</u>	Ā
	A	B		A	A		A			B	A	(-		(A
Lara VII Lead Acetate	D	E	D	D	B		B	B		A	A	B	B	U	B	\vdash		A
Lead Sulfate	D	Ċ	-	D	B		B	B		B	A	B	B	B	B			A
Lecithin Lingletic Astro-	D	(P	C	B		B	B		D	A	D	B	D	D			A
Linoieic Acid	A	B	A	A	A		A	B		A	A	D	A	B	р (\vdash		A
Lithium Chloride	D	B		B	B		A	B		B	A	B	B	B	B			A
LPG	A	A	B	B	B		B	B		A	A	D	A	D	B			A
Lubricaning on Perroleum Base	D	D	A	B	B		B	B		B	B	B	B	B	B	\vdash		A
Magnesium Bisulfate	B	B	B	B	A		Å	B		B	Å	B	B	B	B			A
Magnesium Bisulfide		D		D	B		B	B		B	A	B	B	B	B			A
Magnesium Carbonate Magnesium Chloride	D	B	C	D	B	C	B	B	A	A	A	A	A	A	A	C		A
Magnesium Hydroxide	D	B	B	B	A	A	A	B	В	A	A	A	A	A	A	D		A

COMPATIBILITY				U														
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	·Ē	SS	<u>po</u>	Ť.	S	₽.	>	B	tel		۰E	N.	5	T	Ď	N	lēi	B
	- Pe	ga	5	ă	ĩ	÷	Ĭ	Ŵ	Ŧ	E.	Sel	8	ŧ	ž	Nec	Ň	5	E.
Magnacium Hudravida Hat										P		<u> </u>	-			<u> </u>	<u> </u>	
Magnesium Nitrate		<u>۷</u>	D		A	A	A	R	D	R	A		R	R	D A	<u>۲</u>		A
Magnesium Sulfate	B	B	B	B	Â	A	Å	R	Δ	A	Â	A	A	Å	A A	A		Å
Maleic Acid	B	B	B	Ċ	B	<u>^</u>	B	B	A	B	Â	Ď	Â	Ď	B	<u> </u>		Å
Maleic Anhydride	В	B		B	В		B	B	B	D	C	D	B	D	D			A
Malic Acid	B	B	D	D	В		B	B		A	A		A		Å			Å
Mait Beverage					A		B	A		A	A	B	A		A			A
Manganese Carbonate	B				B		A			B	A					<u> </u>		A
Maganese Sulfate	B	B	D		A		A	D D		В	A	в	В	Б	B A	 	A	A
Ment Luices	R			- ^v	Δ		Å			R	Δ		<u>^</u>	R	R			Δ
Melamine Resins	۴°	<u>۴</u>		D	ĉ		ĉ			B	Â			D	B			Ā
Methanol	B	B		B	Ă		Ā	В		B	C	D	B	D	B			A
Mercuric Chloride	D	D	D	D	B		B	D	B	A	A	A	A	B	B	(A
Mercuric Cyanide	D	D	D	D	A		A	(В	A	A	A	A	В	В			A
Mercurous Nitrate	D	D	L	L	A		A	D		L	A	L	B	B	L			A
Mercury			A	A	A		A	B	B	A	A	A	A	В	A			A
Methyl Acetete	A	A	B	B	A		A	B	A	A	A R	D			B D			A
Methyl Acetone			Δ	Δ				Δ	A .	D D	B	Δ						A
Methylamine	Â	D	B	B	Â		Â	ĉ	В	D	A	B	D	D	D	Â		Ā
Methy Bromide 100%	C	C		D	B		A	В		B	A	D	B	D	D			
Methyl Cellosolve	A	A	В	В	A		A	В	В	(A	В	D	D	D	B		A
Methyl Cellulose			_		A		A		В	D	A			_	D			A
Methyl Chloride	D	B	B	B	A		A	B		D	A	D	B	D	D	A		A
Methylena Chlorida	A	A	A	A	A		A	A	B	D	A	В				A	A	A
Methyl Formate	Ηč		Ċ	r c	R		A	B	B		Δ	R	D	B	R	A .		Δ
Methyl Isobutyle Ketone	⊢` –	⊢^−	L.	L,	Å		Â	<u>۴</u>		D D	Â				D	<u> </u>	A	Ā
Milk & Milk Products	A	B	D	D	A		A	В		A	A	Α	A	В	Ā	A		A
Mineral Oils	A	B	В	B	A		Α	Α		A	Α	D	A	(В			A
Mineral Spirits	A	B	B	B	B	1	В	B		A	A		A		(A
Mixed Acids (cold)	D	D	C	C	B		B	C		D	D	D	B	D	D	C		A
Molasses, crude	B	A	A	A	A		A	A		A	A	<u> </u>	A	В	A	A		A
Molybdic Acid	A .		- ⁽	<u>۲</u>			A	A		A	A	-	A		A	A		A
Monochloro Benzene Dry	<u> </u>	<u> </u>		I –	B		B	В		D	ĉ			/	D		A	Ā
Morpholine	B	B		B	Ā		A	B		D	Ā	В	D	D	D			A
Mustard	В	A	В	B	A		A	Α		A	A		A		A			A
Naptha	A	В	В	B	В		В	В	A	В	A	D	A	((A		A
Napthalene	B	B	B	B	B		B	B	B	D	A	D	A	D	D	A		A
Natural Gas, Sour	B	B	B	B	A		A	U	A	A	A	D	A	U D	A	A		A
Nickel Ammonium Suitate					R		A	R	Δ	A		B		B		A		A
Nickel Nitrate	Τč		Ď	D	B	<u> </u>	Â	B	<u>^</u>	Â	Ċ	A	Â	B	Â	⊢` –	<u>^</u>	Ā
Nickel Sulfate	D	D	D	D	B		A	B	В	A	C	B	A	B	A	A	A	A
Nicotinic Acid	A	A	В	(A		A	A		D	(D	B	D	D			A
Nitric Acid 10%	D	D	D	D	A	A	A	D		(D		A		B	D	A	A
Nitric Acid 30%	D		D	D	A	D	A	D		C C	D	B	A	D	C	D	B	A
Nitric Acid 80%	B						B					B	B				B	A
Nitric Acid Appydrous					A		A										R	A
Nitorbenzene			B	B	Â	<u>ــــــــــــــــــــــــــــــــــــ</u>	Â	B	B	D D	B	Ċ	Ê	D		A		Ā
Nitrogen	Â	Ā	Ā	Ā	A		A	Ā	-	Ā	Ā	B	Ă	B	Ā	<u> </u>		A
Nitrous Acid 10%	D	D	D	D	B		B	D		(B		A		A			A
Nitrous Gases	B	D	B	(A		A	D			B							A
Nitrous Oxide	<u> </u>	B	B	C	B		B	D	B	B	A		A	1	B	A		A
Oils & Fats	B				A		A	в		B	A	D	D D		D D	A		A
Oils, Animai Oils, Patroleum Rafined	A	R	A	A	A		A		A	A	A				R	A		A
Oils. Petroleum Sour	Â	Ċ	B	ĉ	A		A	A	A	B	A	D	A	B	B	A		Å
Oils, Water Mixture	A	A	B	B	A		A		A	A	A		A	<u> </u>	B	A		A
Olaic Acid	B				В		B	A		D	((D	A		A
Oleic Acid	B	B	C	C	В		A	B	B	B	(D	A	D	C	A	A	A
Oleum	B	(B	D	B		B	(B	D D	D	D	ļ (B	D	D D		A
Oleum Spirits		L D	Р				B	D A		E C			A					A
Uiive Uii Ovaliz Azid			L R	B N	A D	n	A	A P		A	A	B D	A A	B	B	A	٨	A
		Δ	R	R	Å	A	A	A	A	R		A	A	D A	R	n n	A	A A
Ozone. Drv	Ê	B	Ċ	Ċ	A	-	A	Â	A	Ď	ť	B	B	B	Ď	Ď		Ă
Ozone, Wet	B	B	Ċ	Ċ	A		A	A	A	D	Ċ	B	B	B	D	D		A
Paints & Solvents	A	A	A	A	A		A	A		D	A	D	B	D	D			A
Palmitic Acid	B	B	(C	B		B	B		B	A	B	A	D	B	D		A
Palm Oil	A	B	((B		A	A		B	A	D	A	D	B	A		A
Paper Pulp Develop	1	B	р	B	A		A	B ∧	4	B	A	B	B	B	B	A		4
raramn	A	A	Ď	Б –	Å		A	A	A	A	A	U U	A	в	Ľ	A		A

				ron	el									C	OM	PA	IBI	.ITY
	Aluminum	Brass	Carbon Steel	Ductile Iron/Cast	316 Stainless Ste	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin	EPDM/EPR	Viten	Hypalon	Neoprene	Nylon	Grafoil	Teflon
Paraformaldehyde	B	B	B	B	B		B	B		B	A	D			B			A
Parldehyde					B		B			B	A	D			B		A	A
Pentane	A	A	B	B	A		A	B		A	A	D	A		B			A
Perchlorethylene, dry	B		B	B	A		A	R	R	U Å	B	U	A	U	D	A		A
Phenol	D A	R			A	R	A	A	A	A D	A	D	R		D	D		A
Phosphate Ester 10%	Ď	D	A	A	A		Â	Â	<u></u>	D	Ă	A	<u> </u>	-	-	A		Â
Phosphoric Acid 10%	D	D	D	D	D	B	B	D		B	D	B	A	В	A	D	A	A
Phosphoric Acid 50% Cold	D	D	D	D	B	B	B	(B	D	B	A	B	B	D	A	A
Phosphoric Acid 50% Hot	D	D	D	D	D	D	B	C		B	D	В	A	B	B	D	A	A
Phosphoric Acid 85% Cold	D	D	B	B	A	(B	A		C	D		В	B	(D	A	A
Phosphoric Acid 85% Hot Phosphoric Aphydride		U U	<u>ر</u>	ι.	N N	U	B				D R		R	R		D	A	A
Phosphorous Trichloride	D		B		Δ		A A				D	B	B		D	D		Δ
Phthalic Acid	B	В	Č	Ċ	B		B	A	В	Č	B		Ā		Č	Ă	<u> </u>	Â
Phthalic Anhydride	B	В	C	C	В		В	A	A	C	Α		A		(A		A
Picric Acid	(C	D	D	В	C	В	D	В	C	D	В	В	В	A	В		A
Pineapple Juice	A	(((A		A	A		A	A		A	D	A			A
Pine Oil	B	В	В	В	A		A	В		A	A	D	A	D	D		 	A
Pitch (Bitumen)	n	l n		R	R		A	R			A	B	R	R	R			A A
Polyvinyl Acetate	B	B		B	B		B	B		<u> </u>	A	B		B	Č			Â
Polyvinyl Chloride	B	B		B	B		B	B			A	В		B	(A
Potassium Bicarbonate	A				A		A	В		В	Α							A
Potassium Bichromate	A				A		A	A		B	B		B		B			A
Potassium Bisultate	B				A		A	B		B	A	D	A	C	B		i —	A
Potassium Bisitite		H			B A	6	B	D R		A	A	B	A	R	A			A
Potassium Carbonate	D	B	B	B	B	A	B	B	1	A	A	B	A	B	A			A
Potassium Chlorate	Č	B	B	B	B	B	B	Č	1	A	A	B	Â		A			Â
Potassium Chloride	D	C	C	В	В	В	A	В	В	A	Α	Α	Α	В	Α	Α		A
Potassium Chromate	B	В		B	В		В	В		В	Α	В	В	В	A			A
Potassium Cyanide	D	D	B	B	B		B	B	B	A	A	A	A	B	A			A
Potassium Dichromate	A				B	D	A	B		A	A	B	A	В	A			A
Potassium Ferrocyanide	B			$\frac{1}{c}$	R	D	B	Δ			A A	D	A		A			Δ
Potassium Hydroxide Dilute Cold	D	D	Ă	Ă	B	В	B	Â		Â	D		D	В	B	В		A*
Potassium Hydroxide to 70%, Cold	D	D	B	В	В	C	В	A		B	D	В	D	В	В	В		A *
Potassium Hydroxide Dilute Hot	D	D	В	B	B	(В	A		B	D				B			A*
Potassium Hydroxide to 70%, Hot	D	D	A	B	B	D	B	A		C	D	A		A	B			A*
Potassium Iodide	D	D			B	B	B		D	A	A	В	A	D	A		i — - I	A
Potassium Oxalate	A (В	В	Δ	D	Δ	D	В	A	Δ	D	A	Б	A			Δ
Potassium Permanaganate	B	В	В	В	B	В	B	В	В	A	Â	В	A	В	A			Â
Potassium Phosphate	D	C		C	В		В	В	В	A	Α	Α	A	В	A	Α		A
Potassium Phosphate Di-basic	B	B	A	A	Α		A	В	B	A	A	В	Α		Α	Α		A
Potassium Tri-basic	D		A	A	B		B	B		B		B			B	A	 	A
Potassium Sulfate	A	B	B		A	A	A	B		A	A	A	A	B	A	A		A A
Potassium Sulfite	B	B	B	B	A		A	$\frac{1}{c}$	B	B	A A	Δ	B	B	B	A A		Α Δ
Producer Gas	B	B	B	B	B	A	B	Â	<u> </u>	A	A	D	A		B			A
Propane Gas	A	A	В	В	В	A	A	В	A	A	Α	D	A	В	В	A		A
Propyl Bromide	B	B		B	B		A	B		B	A	В	B	D	B			A
Propylene Glycol	A	B	В	B	B		B	B		A	C	В	A	В	A		 	A
Pyrolaglic Acid	B	R	R	B	B	R	A	R			D A				D A		i – – I	A A
Quench Oil	A	B	B	B	A	U	A			A	A		A	В	B			A
Quinine, Sulfate, dry		-		-	A	В	A	В			A			-				A
Resins & Rosins	A	A	C	C	Α	В	A	A		C	A		A		(A		A
Resorcinol		<u> </u>	L	<u> </u>		В	<u> </u>	B					<u> </u>					A
Road lar Poof Ditch	A	A	A	A A	A		A	A		B	A A	U	A	D	(A
Rosin Finulsion	A	R	A C	A (A		A	A		D	A		R		-			<u>Α</u>
R P-1 Fuel	A	Ā	Ă	Ă	A		Â	Â		B	Ā		A		č			Â
Rubber Latex Emulsions	A	Å	B	B	A		A				A		A					A
Rubber Solvents	A	A	A	A	A		A	A		D	C	-	D	_	(A
Salad Oil	B	B	((B		A	B		A	A	B	A	B	A			A
Salicylic Acid					A		B B	B	—	A	A A	B	A A	B	A A		⊢ – ∣	A
Salt Rrine	B	R	<u>۲</u>	D	B		R	R		A A	Å	B	R	D	D N	(Å
Saverkraut Brine	L.	L			B		B	L.		Ê	Ĉ		L.	L.		,		Â
Sea Water	(C	D	D	B		B	A		A	A	A	A	(A	(A
Sewage	(C	C	D	B	A	B	B		A	B	B	B	B	(A
Shellac Ciliana Eluide	A	A	A	B	A		A	A	I	A	A		D	D	A		⊢	A
Silver Bromide	D D			Ď	D A	(D A	R		D	A D		0	Ď	D			A
					м		- ⁻	. "										м

	Aluminum	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	• Delrin	, EPDM/EPR	Viton	Hypalon	, Neoprene	, Nylon	Grafoil] Teflon
Silver Lydnide			<u> </u>		A			A	В		B	D A		B	B	B		A
Silver Plating Sol		<u> </u>	<u> </u>	<u> </u>	A		A	U	I	<u> </u>	R R	A	A	D		 		A
Som Solutions (Stearates)	Ċ	A	A	B	Â		Â	A		A	Ă	A	A	B	B			Å
Sodium Acetate	B	B	ĉ	Ċ	B		B	B	B	B	A	B	A	D	B	A		Å
Sodium Aluminate	D	В	((A		B	B	B	A	A	B	A	В	A	A		Å
Sodium Benzoate	B				B		B	B			B							A
Sodium Bicarbonate	B	В	(C	B		A	B		A	B	A	A	B	A			A
Sodium Biculfato 10%	A	D	D		B A		B	D			A	P		B				A
Sodium Bisulfite 10%	D	B	D	D	A		B	B	B	A	D	B		B	A A	A		A
Sodium Borate	B	B	Č	Ċ	B		B	B	<u> </u>	A	Ā	B	A	B	A	<u> </u>		A
Sodium Bromide 10%	В	B	(D	B		B	В		A	A	B	A		A			A
Sodium Cargonate (Soda Ash)	D	B	B	B	A		A	B	B	A	A	B	A	B	A	A		A
Sodium Chlorate	<u>(</u>	B			B		B		B	A	A	B	A	B	A		B	A
Sodium Chromate	B D		R		B A		R	R	Б	A	A	B	A	Б	A A	A	A	A A
Sodium Citrate		⊢`-	- ^v	– –	B		B	– –		<u>^</u>	Â	- ^v	<u> </u>		<u>^</u>			A
Sodium Cyanide	D	D	B	B	A	В	Ā	B		A	A	В	A	В	A			A
Sodium Ferricyanide	Α				A		Α	В			A							A
Sodiulm Fluoride	(C	D	D	B	B	A	B		A	A	B	A	B	A	(A
Sodium Hydroxida 20% Cold		A	A	A	A	A	B	A	1	A	D	B	B	B	A		A	A*
Sodium Hydroxide 50% Cold			Δ	R	A	R	A	A	/	Δ		B	$\frac{1}{c}$	B	Δ		A	Α Δ*
Sodium Hydroxide 50% Cold	D	Â	B	B	Â	Ċ	Â	B		B	D		Ċ	B	B	t	Â	A*
Sodium Hydroxide 70% Cold	D	A	A	A	A	В	B	Α		B	D	В	C	В	C	C	A	A*
Sodium Hydroxide 70% Hot	D	B	В	В	A	C	В	B	- I	D	D	В	(В	D	(A	A*
Sodium Hypochlorite (Bleach)	D	D	D	D	D	D	(D	A	L	D		A		L	B		A
Sodium Hyposulfite	B	 		I	B B	-	B	B		<u> </u>	A				 	 		A
Sodium Metanhosnhate			R		R	B	B	D	Δ	Δ	B	B	-	B	Δ		Δ	A
Sodium Metasilicate Cold	B	B	Č	t	Ā		A	A		B	Ă		В	B	Â	A	<u> </u>	A
Sodium Metasilcate Hot	В	B	D	D	A		A	A	A		A							A
Sodium Nitrate	A	B	B	B	A	B	Α	B	B	(A	B	A	В	B	A		A
Sodium Nitrite	A				B	D	B		B		B	A	B		D	A		A
Sodium Perborate	B		B	B	B	B	B	B	B		A	A	A	L B	B			A
Sodium Phosphate	ι č		t	1 c	B	B	B	B	B	B	B	A	Δ	B	C	Δ		Δ
Sodium Phosphate Di-basic	D	t	Ċ	Ċ	B	<u> </u>	B	B	B	Ā	Ā	A	A		Ă	Â		A
Sodium Phosphate Tri-basic	D	(((B		В	В	B	В	A	A	Α		B	A		A
Sodium Polyphosphate					B		B	В	В	В		A			B			A
Sodium Salicylate					A		A			L .	A				L			A
Sodium Silicate hot	B C		B	B	B		B	B		A	R	В	A	Б	A			A
Sodium Sulfate	B	B	B	B	A	B	Ā	A		A	A	A	A	A	A			A
Sodium Sulfide	Ċ	D	B	B	B	Ā	B	B		A	A	B	A	B	A	A		A
Sodium Sulfite	В	(A	A	A	A	В	В	A	A	В	B	В	A	D		A
Sodium Tetraborate				A	A		A			A	A	B			A			A
Sodium Thiosultate	B		B		B	A	B	B		A	A	A	A	B	A	A		A
Soybean Oli	R	R	$\frac{1}{c}$		R		A	A A		A	Δ	C B	A A	B	Δ	<u> </u>		Α Δ
Steam (212F)	A	A	A	Ā	A	A	Â	B		D	D	B	1 ĉ	B	D	<u> </u>	A	A
Stearic Acid	A	(C	C	B		B	В	A	A	A	В	A	В	C	A	A	A
Styrene	A	A	A	B	A		A	В	A	D	A	D	В	D	D	A		A
Sugar Liquids	A	A	B	B	A		A	A		A	A	B	A	D	A			A
Sugar, Syrup & Jam	B		- C		D	A	A	D			A	D			B	 		A
Sulfate Green Liquor		$\frac{1}{2}$	$\frac{c}{c}$	$\frac{1}{c}$	B		R	B		$\frac{1}{c}$		D	$\frac{1}{c}$		R	<u> </u>		Δ
Sulfate, White Liquor	B	t	č	t	B	B	D	Č		t	D		t	D	B			A
Sulfur	A	D	((В		Α	В		D	A	B	В	В	(C		Α
Sulfur Chlorides	D	B	D	D	D		A	B		D	A	(A	B	D		A	A
Sultur Dioxide, dry	A	B	В	B	A	A	B	B	A	D	A	A	A	D	D	A	A	Å
Sulfur Heyafluoride		D B			A	<u> </u>	B	A	B	<u>۷</u>	U	B	<u> </u>	R		I	A	A
Sulfur Malten	Â		C	В	B		A	D	B	D	D	B	B	B	Ċ	<u> </u>		Å
Sulfur Trioxide	<u> </u>	B	B	B	B	В	B	Ť	B	Ď	D	L	B	D	Ď		D	A
Sulfur Trioxide, dry	A	B	B	B	B	B	B	B	B	D	A	B	A	D	D	A	D	A
Sulfuric Acid 0 to 77%	((D	D	(B	B		B	D		A	B	B	D	A	A
Sulturic Acid 100%	D			B	A	B	A	D	D	D	D		B	B	D	D	D	A
SUITUROUS ACID			R	R	R		R	R	Б А			L D	A	D D	R		A	A A
Tannic Acid (Tannin)	Ċ	B	, (í.	B	B	B	B	B	B	A	B	A	B	B	A		A
Tanning Liquors	À	<u> </u>	L.	L .	B	<u> </u>	B	<u> </u>	<u> </u>	B	Ď	<u> </u>	<u> </u>	<u> </u>	D	<u> </u>		A
Tar & Tar Oils	A	A	A	A	A	A	A	A		(A	D	A	D	D			A
Tarlaric Acid	B	B	D	D	A	A	A	B	B	(A	B	A	B	B			A
letræthyl Lead	В	В	C	C	В		В	A			A							A

CHEMICAL COMPATIBILITY	Aluminum	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin	EPDM/EPR	Viton	Hypalon	Neoprene	Nylon	Grafoil	Teflon
Toluol (Toluene)	A	Á	A	A	Á		Á	A	A	D	C	D	B	D	D	A		A
Tomato Juice	A	C	C	(A		A	B		A	A		A	D	A			A
Transformer Oil	A	B	A	В	A		A	A		A	A		A		B			A
Tributyl Phosphate	A	A	A	A	A		A	A		D	A	B	D	D	D	A		A
Trichlorethylene	A	B	B	C	B	A	B	B	A	D	A	D	B	D	D	A	A	A
Trichloroacetic Acid	D	B		D	D		B	В	A	(D		D		D			A
Triethanolamine	В				В		B	В	A	(A	B		В	B			A
Triethylamine		В			В		B		A	B	(B			A
Trisodium Phosphate	D				В		B		A	A	Α	В	B	В	A			A
Tung Oil	В	В	В	B	Α		A	C	Α	Α	Α	D	A	D	B			A
Turpentine	В	В	В	В	В	A	B	В	A	B	Α	D	A	(D	A		A
Urea	В	B	C	(В		B	В	A	(Α	В	D	D	B			A
Uric Acid	D				Α		A		Α		В							A
Varnish	A	A	((Α		A	A	A	(Α	D	B	D	B			A
Vegetable Oils	A	В	В	В	Α		A	В	A	Α	Α	D	Α	В	B			A
Vinegar	(В	D	D	Α		Α	В	Α	D	В	Α	D	(D			A
Vinyl Acetate	В	B		В	В		B	В	Α		D	A		В	B	A	A	A
Water, Distilled	A	A	D	D	Α	Α	A	A	Α	(Α	В	A	В	В			A
Water, Fresh	A	A	C	(Α	A	A	A	A	(Α	В	A	Α	B	C		A
Water, Acid Mine	D	D	D	D	В	В		D	(B	Α	A	D	(A		A	
Waxes	A	A	A	A	A		A	A	A	Α	A	(Α	В	B			A
Whiskey & Wines	D	B	D	D	A		A	A	Α	B	Α	A	A	(B	A		A
Xylene (Xylol), Dry	A	A	В	B	Α		Α	Α	Α	D	Α	D	B	D	D	A	A	A
Zinc Bromide	D	В		D	В		В	В	Α	В	Α	В	В	В	В			A
Zinc Hydrosulfite	D	C	A	B	A		A	В	Α	Α	Α	A	A		A			A
Zinc Sulfate	D	B	D	D	B		A	B	A	A	A	A	A	В	A		A	A

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Pipe	Valves	Flanges	Weld Fittings	Screwed and Socket Fittings
A-335 P-1	A-217 WC-6	A-182 F-1	A-234 WP-1	A-182 F-1
A-335 P-12	A-217 WC-6	A-182 F-12	A-234 WP-12	A-182 F-12
A-335 P-11	A-182 F11/A-217 WC-6	A-182 F-11	A-234 WP-11	A-182 F-11
A-335 P-22	A-182 F-22/A-217 WC-9	A-182 F-22	A-234 WP-22	A-182 F-22
A-335 P-5	A-182 F-5/A-217 WC-5	A-182 F-5	A-234 WP-5	A-182 F-5
A-335 P-7	A-182 F-7/A-217 WC-12	A-182 F-7	A-234 WP-7	A-182 F-7
A-335 P-9	A-182 F-9/A-217 WC-12	A-182 F-9	A-234 WP-9	A-182 F-9
A-268 T-410	A-182 F-6/A-351 CA-15	A-182 F-6	A-234 WP-410	A-182 F-6

CHROME-MOLY ALLOYS

CARBON STEELS

Pipe	Valves	Flanges	Weld Fittings	Screwed and Socket Fittings
A-53	A-105	A-105, A-181	A 224 W/DD	A-105, A-181
	A-216 WCB	Grade 2	A-234 WFD	Grade 2
A-106B	A-105	A-105	A 224 W/DD	A-105 Grade 2
	A-216 WCB	A-181 Grade 2	A-Z34 WFD	A-181 Grade 2

LOW-TEMPERATURE STEELS

Pipe	Valves	Flanges	Weld Fittings	Screwed and Socket Fittings
A-333 Grade 6	A-350 LF-2/A-352 LCB	A-350 LF-2	A-420 WPL-6	A-350 LF-2
A-333 Grade 3	A-350 LF-3/A-352 LCS	A-350 LF-3	A-420 WPL-3	A-350 LF-3

STAINLESS STEELS

Pipe	Valves	Flanges	Weld Fittings	Screwed and Socket Fittings
A-312 T304	A-182 F-304/A-351 CF8	A-182 F-304	A-403 WP-304	A-182 F-304
A-312 304L	A-182 F-304L/A-296 CF3	A-182 F-304L	A-403 WP-304L	A-182 F-304L
A-312 T316	A-182 F-316/A-351 CF8M	A-182 F-316	A-403 WP-316	A-182 F-316
A-312 316L	A-182 F-316L/A-296 CF3M	A-182 F-316L	A-403 WP-316L	A-182 F-316L
A-312 321	A-182 F-321/A-351 CF8C	A-182 F-321	A-403 WP-321	A-182 F-321
A-312 347	A-182 F/347/A-351 CF8CM0	A-182 F-347	A-403 WP-347	A-182 F-347

MATERIAL MARKINGS

30455	34755	HASTELLOY A	3% NICKEL CAST IRON
304	347		
CF8	CF8C	HAST A	3NI
18 8 5	CF82B	HA	CIA
L22	188SCB	HAA	NCI*
D2	188CB	A	
33 (JB)	D2CB		
8 ♦ (LAD)	410SS	HASTELLOY B	NI RESIST CAST IRON
S (ALOYCO)	CR13		
D (CONTRO)	11 13	HAST B	NR
F8	F6	HB	NR2
KA2S	EXELLOY (CRANE)	HAB	CAUSUL*
304LSS	CA 15	N7M	
CF3	FERRALIUM	N12M	SPECIAL
1885 ELC	CD4M	N2	
D2L	CD4MCU	DC2	A-254-SMO
DF8L	DURCOMET 100	B♦ (LADISH)	
188 ELC	38 (JB)	NiMO	LOW TEMP STEELS
31655	ALUMINUM	CW12M	
316	AL		LCB (CAST CARBON)
CF8M	44 (JB)	HASTELLOY C	LC1 (CAST 1/2 % MOLY)
188SMO	ALUM		LC2 (CAST 2 1/2 % NICKEL)
188M	MONEL 400	HAST C	LC3 (CAST 3 1/2 % NICKEL)
188MO	M35	НС	LF1 (FORGED CARBON)
L22XM	M35W	HAC	LF2 (FORGED CARBON)
D4	DM	CW7M	LF3 (FORGED 3 1/2 NICKEL)
CF7M	M	CW12M	
8M♦ (LAD)	MNL	N3	CARBON STEEL
36 (JB)	MONL	DC3	
6 (HMC)	MLCB	C♦ (LAD)	WCB (CAST)
0 (ALOYCO)	MON	73 (JB)	A 105 (FORGED)
C (CONTRO)	ML	NIMOCR	22 (JB)
KA2SMO	EM		DS
31/55		HASTELLOY D	L C
CG8M	QQN-1/7 (LAD)		
310LSS	COMPE (LAD)	HASI D	1 1/4% CR 1/2% MULT
316L	K (IKIM)	HU	
	/ I (JB)	HAD	W(6 (LASI)
1885MU ELC		TITA MUUAA	FTT (FURGED)
	NICKEL 200	IIIANIUM	2 1 /49/ CD 1 /29/ MOLY
	NI	T	2 1/4% CR 1/2% MULT
	UNI (7100		WC0 (CAST)
ALLOT 20	79 (10)	I♥ (LAD)	
AZU JZU	/ 0 (JB) (71005	II♥ (LAD)	F22 (FORGED)
CN/M FA20			5% CD 1 /2% MOLV
C20 L34	LNI	DOCTILE IKON	J70 CK 1/ 270 MOLI
		DI	
25 / ID		21 / 101	
23 (DV)		21 (JD)	
			0% CR 1% MOIV
			770 CK 170 MULI
		AAI	
	70	AAATI	
CAD.20	<u>۲۳</u>	MALL	
040-20			

*The information contained herein is general in nature. Reference should be made to the manufactureing catalog for individual m anufacturer markings.

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RESILIENT SEAT MATERIALS

VITON® (Fluorocarbon, FKM, or FPM)

Fluorocarbon elastomers are inherently compatible with a broad spectrum of chemicals. Because of this extensive chemical compatibility which spans considerable concentration and temperature ranges, fluorocarbon elastomers have gained wide acceptance as a material of construction for knife gate valve seats. Fluorocarbon can be used in most applications involving mineral acids, salt solutions, chlorinated hydrocarbons and petroleum oils. It is particularly good in hydrocarbon service. Temperature rating is from -20°F to +300°F. Color is gray (black) or red and may be used on bleached paper lines. Fluorocarbon (VITON) is not suitable for steam or hot water service.

BUNA-N (HYCAR or Nitrile)

Buna-N is a general purpose polymer which has good resistance to oil, water, solvents and hydraulic fluids. It also displays good compression, abrasion resistance, and tensile strength. This material performs extremely well in process areas where paraffin base materials, fatty acids, oils, alcohols or glycerins are present, since it is totally unaffected. It should not be used around high polar solvents (acetones, ketones) chlorinated hydrocarbons, ozone, or nitro hydrocarbons. Temperature range is +225°F maximum. Hycar is black in color and should not be used where discoloration cannot be tolerated. It is regarded as a comparable replacement to neoprene. Major differences are: Buna-N has a higher temperature limit; neoprene is more resistant to oils.

HYPALON®

Hypalon has very good resistance to oxidation, ozone and good flame resistance. It is similar to neoprene except with improved acid resistance where it will resist such oxidizing acids as nitric, hydrofluoric and sulfuric acid. Abrasion resistance of Hypalon is excellent, about the equivalent of the nitriles. Oil and solvent resistance is somewhat between that of neoprene and nitriles. Salts have little if any effect on Hypalon. Hypalon is not recommended for exposure to concentrated oxidizing acids, esters, ketones, chlorinated, aromatic and nitro hydrocarbons. Not to be used in steam service. Temperature rating is from 0°F to +220°F. Seats are white food grade and may be used on food service as well as bleached paper lines.

NEOPRENE

Neoprene was one of the first synthetic rubbers developed. It is an all purpose polymer with many desirable characteristics. Neoprene features high resiliency with low compression set flame resistance and animal and vegetable oil resistance. It is principally recommended for use in pulp and paper applications. Generally, neoprene is not recommended and is attacked by strong oxidizing acids, most chlorinated solvents, esters, ketones, aromatic hydrocarbons and hydraulic fluids. Neoprene is not generally affected by moderate chemicals, fat, greases and many oils and solvents. Temperature rating is from -20°F to +180°F. Seats are black in color and should not be used on bleached paper lines.

EPDM

EPDM is a terpolymer elastomer made from ethylene-propylene diene monomer. EPDM has good abrasion and tear resistance and offers excellent chemical resistance to a variety of acids and alkalines. It is susceptible to attacks by oils and is not recommended for applications involving petroleum oils, strong acids, or strong alkalines. EPDM should not be used on compressed air lines. It has exceptionally good weather aging and ozone resistance. Temperature rating is from -20°F to +225°F (250°F intermittent service). It is fairly good in ketones and alcohols.

PTFE (TFE or Teflon®)

PTFE is the most chemically resistant of all plastics. It also has excellent thermal and electrical insulation properties. PTFE's mechanical properties are low compared to other engineering plastics, but its properties remain at useful levels over a great temperature range (-40 to 400 °F, depending on application).

RESILIENT SEAT MATERIALS

(continued)

RTFE (Reinforced TFE)

RTFE is compounded with a selected percentage of fiber glass filler to improve strength and resistance to abrasive wear, cold flow, and permeation in molded seats. Reinforcement permits application at higher pressure and temperature than unfilled TFE. Typical temperature range is -40°F to 450°F. RTFE should not be used in applications that attack glass, such as hydrofluoric acid and hot strong caustics.

Carbon Filled TFE

Carbon filled TFE is an excellent seat material for steam applications as well as high efficiency oil-based thermal fluids. Fillers including graphite enable this seat material to have a better cycle life than other filled or reinforced TFE seats. Temperature range is -20°F to 500°F. Chemical resistance is equal to other TFE seats.

THERMOPLASTIC MATERIALS

UPVC (Unplasticised PVC)

Unplasticised Polyvinyl Chloride is the most widely used of all plastics and commonly used for pressure pipes. It is rigid, suitable for above and below ground applications. UPVC has good chemical resistance and is odorless and tasteless. It is for use with liquids and gasses with temperatures +32°F to +140°F (for higher temperatures see CPVC) at a wide range of operating pressures. Some poorer quality PVC can leach chemicals into that water which can build up in recirculation systems, however most modern pipe is built to specific standards (e.g. BS3505/6, ASTM D 1785, ASTM D 2241, DIN 8061/2, KIWA 49, BS4346 PART 1, DIN 8063) and as long as the pipe is rated as such, there should be no problems. UPVC is usually joined using a push fit solvent cement joint, requiring no special tools.

CPVC (Corzan[™]) (Chlorinated PVC)

Chlorinated polyvinyl chloride, or CPVC, has been offering the process industry superior corrosion resistance, mechanical strength, and excellent life-cycle economics in a single package. Conceptually, CPVC is a PVC homopolymer that has been subjected to a chlorination reaction. It is generally inert to most mineral acids, bases, salts, and paraffinic hydrocarbon solutions. CPVC is not recommended for use with chlorinated or aromatic hydrocarbons, esters, or ketones. The upper temperature limit on Corzan[™] CPVC is 200°F. There is no lower temperature limit on Corzan[™] CPVC and the material will withstand pressure. At very cold temperatures, the material will become brittle and the impact strength will decline.