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INTRODUCTION TO THERMOPLASTIC VALVES INCORPORATED

The TVI thermoplastic valve line is manufactured by one of the largest plastic valve manufacturers in the world. Thirty years of valve designing and injection molding experience, have earned them the reputation of a quality manufacturer of thermoplastic valves.

The manufacturing facilities include, two production sites totaling 250,000 square feet, 32 injection molding machines, six assembly lines employing more than 180 people. The product is exported to 39 countries throughout the world. The factory maintains stringent quality control standards carried out during the complete manufacturing process; including a 100% valve testing program performed on every valve. The company's ball valve design and manufacturing process has the NSF (National Sanitation Foundation) approval and they are ISO9002 approved.

For the past fifteen years, TVI has been the sole master distributor for their complete diversified thermoplastic valve line. TVI has ten regional sales engineers along with stocking distributors throughout the United States, parts of Canada, Mexico, the Caribbean and South America. We are extremely proud of our working relationship with our manufacturer.

TVI services industries that require complete resistance to corrosion, galvanic corrosion (electrically non-conductive) and contamination in both metal and plastic piping systems. These industries include but are not limited to: water filtration, water purification, waste water filtration, de-ionized water, agriculture, including irrigation, fertilization and pesticide applications, aqua-culture, mining, pharmaceutical, chemical processing, swimming pools and spas, aquariums, the photographic industry, metal finishing, food processing, paper processing, petro chemical, fluid circulation systems and finally original equipment manufactured products (OEM accounts).

TVI's commitment to the areas we serve is equal to or surpasses that of our competitors. In addition to our outstanding service policy our valves carry a full warranty against defects in material and/or workmanship under use and service for a period of one year from date of shipment.

THERMOPLASTICS AND ELASTOMERS

- ABS** ACRYLONITRILE - BUTADIENE - STYRENE - Class 4-2-2 conforming to ASTM D-1788. Temperature range from -40 degrees F to 180 degrees F. Excellent resistance to deposit formation. Superior resistance to sewage and common chemical formulations. Good impact resistance (many automotive parts, bumpers and panels). ABS can be joined by cementing, threading and flanging.
- PVC** POLYVINYL CHLORIDE - Class 12454-B Type 1, Grade 1 to ASTM 1784. Temperature range from -30 degrees F to 140 degrees F. PVC is the most common and most widely used thermoplastic material. It resists most acids, strong Alkalis, salts and paraffinic hydrocarbon solutions. Excellent for industrial chemical and plating systems, deionized water, irrigation and drainage systems. PVC is not recommended for use with chlorinated or aromatic hydrocarbons, esters or polar solvents such as ketones. The material can be joined by cementing, threading or flanging.
- CPVC** CHLORINATED POLYVINYL CHLORIDE - Class 23447-B Type IV Grade 1 to ASTM D-1784. The physical properties at 73 degrees F are very similar to PVC. CPVC has a slightly better chemical resistance and has a higher temperature range to 210 degrees F. It is not recommended for use with chlorinated or aromatic hydrocarbons, esters or polar solvents such as ketones. The material can be joined by cementing, threading or flanging.
- PP** POLYPROPYLENE - Type 1 to ASTM D-4101 class PP10-B67154. Temperature range from -30° F (degrees F) to maximum 180°F (degrees F) but at this temperature we recommend it's use only with water or drainage. PP is the lightest of all plastics. Resistant to organic solvents, acids and alkalies. It is not recommended for oxidizing acids, chlorinated hydrocarbons or aromatics. Mostly used for sulfur-bearing materials, saltwater solutions, crude oil and low pressure gas systems. PP can be joined by thermo-seal fusion, threading or flanging.
- PVDF** POLYVINYLIDENE FLUORIDE - ASTM D-3222 having a temperature range of -80 degrees F to 280 degrees F. The strongest, heaviest and most abrasion resistant of the thermoplastic materials. PVDF is resistant to most acids, bases and organic solvents and is the only thermoplastic resistant to wet or dry chlorine, bromine and other halogens. PVDF can be joined by thermo-seal fusion, threading or flanging.
- EPDM** A terpolymer elastomer made from ethylene-propylene diene monomer. Recommended for water, chlorinated water, dilute acids, alkalines, alcohols and ozone. Not recommended for petroleum oils, strong acids and alkalines. EPDM has a temperature range from -20 degrees F to 230 degrees F.

VITON ® FLUOROCARBON ELASTOMER - Recommended for hydrocarbon service, mineral acids, salt solutions, chlorinated hydrocarbons and petroleum oils. Viton has the broadest temperature range of the elastomers from -20 degrees F to 300 degrees F but should not be used in steam service.

NITRILE (BUNA-N) - A copolymer of butadiene and acrylonitrile. Has good resistance to solvents, petroleum oils and fluids, di-ester lubricants, ethylene glycol based fluids, aliphatic hydrocarbons and aromatic solvents. It should not be used with acetone and methyl ethyl ketone, chlorinated hydrocarbons, ozone or nitro hydrocarbons. Temperature range from -20 degrees F to 180 degrees F.

HYPALON ® A chlorosulfonated polyethylene elastomer and has good resistance against nitric, hydrofluoric and sulfuric acids, aliphatic hydrocarbons and aromatic solvents. It is not recommended for exposure to concentrations oxidizing acids, esters, ketones, chlorinated, aromatic and nitro hydrocarbons. Temperature range from -20 degrees to 200 degrees F.

NEOPRENE A chlorinated synthetic rubber elastomer. It is flame resistant and resists animal and vegetable oils. Recommended for food and beverage service. Normally not effected by moderate chemicals, fats, greases and many oils and solvents. Neoprene is not recommended for strong oxidizing acids, esters, ketones, hydraulic fluids, chlorinated solvents and aromatic hydrocarbons. Temperature range from -20 degrees F to 160 degrees F.

TEFLON ® POLYTETRAFLUOROETHYLENE - A self lubricating compound. Resistant to almost all chemicals and solvents and has a very high thermal- stability, also nonflammable. Temperature range of -20 degrees F to 400 degrees F.

VITON, HYPALON & TEFLON ® are registered trademarks of DuPont Dow.

RESINS USED IN THE MANUFACTURING OF "TVI" THERMOPLASTIC VALVES

A. PVC RESIN

Type 1, Grade 1, N.S.F. registered, GEON 87321 with PVC compounds - gray 272 and white 124 and tin stabilized as manufactured by B.F. Goodrich Chemical Group (U.S.A.)

B. CPVC RESIN

Temprite Grade CPVC as manufactured by the B.F. Goodrich Chemical Group (U.S.A.)

C. PP RESIN

Resin as manufactured by Chisso-Tokuyama (Japan)

D. PVDF RESIN

Solef Resin as manufactured by the Solvay Company of Belgium is being used.

Upon request: Physical property & material guides are available.

PHYSICAL PROPERTIES OF PVC, CPVC, PP & PVDF

PROPERTIES	PVC	CPVC	PP	PVDF	TEST METHOD REF.
COEFFICIENT OF EXPANSION, IN./IN./°FX105	3.1	3.7	5.2	7.7	ASTM - D696
COMPRESSIVE MODULUS, 10 ³ PSI	240-250	250-280	125-150	15-195	ASTM - D695
COMPRESSIVE STRENGTH, PSI	12,500-14,000	14,000-15,500	8500-9800	12,500-14,000	ASTM - D695
DIELECTRIC STRENGTH, KV/IN.	0.9	0.9	1.0	1.18	ASTM - D149
ELONGATION, %	60 - 120	20 - 40	150 - 200	30 - 50	ASTM - D638
HARDNESS, ROCKWELL R	112	116	96	110	ASTM - D785
HEAT DEFLECTION, ° F @ 264 PSI	160	212	202	230	ASTM - D648
HEAT RESISTANCE, ° F	140	210	180	280	
IZOD IMPACT, FT. LBS./IN., V NOTCH	.65	1.6	2.5	6.0	ASTM - D256
SPECIFIC GRAVITY	1.41	1.53	.91	1.76	ASTM - D792
TENSILE STRENGTH PSI	7400	8800	5000	7200	ASTM - D638
WATER ABSORPTION 24HR/ % a 73 DEG. F	0.06	0.06	0.2	0.03	ASTM - D570

CODE REFERENCE DATA

ASTM - D1784	RIGID PVC & CPVC COMPOUNDS	ASTM - D2855	PVC SOLVENT CEMENTED JOINTS
D1785	PVC SCHED. 40 & 80 PIPE SPECS.	F - 439	CPVC SCHED. 80 SOCKET FITTINGS
D2464	PVC SCHED. 80 THREADED FITTINGS	F-441	CPVC SCHED. 80 PIPE SPECIFICATIONS
D2466	PVC SCHED. 40 SOCKET SPECS.	F-493	CPVC SOLVENT CEMENTS
D2467	PVC SCHED. 80 SOCKET SPECS.	ANSI B16.1	FLANGE SPECIFICATIONS
D2564	PVC SOLVENT CEMENTS	B2.1	THREADED FITTINGS & PIPE SPECS.
NSF 14	POTABLE WATER & QUALITY CONTROL STANDARDS		

SCHEDULE 80 THERMOPLASTIC PIPE STANDARDS

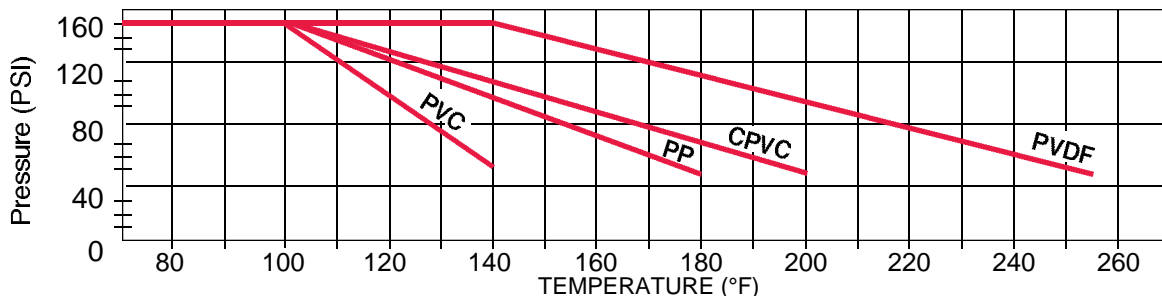
NOMINAL PIPE SIZE	INSIDE DIAMETER (IN.)	OUTSIDE DIAMETER (IN.)	WALL THICKNESS (IN.)
1/2"	.528	.840	.147
3/4"	.724	1.050	.154
1"	.935	1.315	.179
1 1/4"	1.256	1.660	.191
1 1/2"	1.476	1.900	.200
2"	1.913	2.375	.218
2 1/2"	2.289	2.875	.276
3"	2.864	3.500	.300
4"	3.326	4.00	.337
5"	4.767	5.563	.375
6"	5.709	6.625	.432
8"	7.565	8.625	.500

PRESSURE (PSI) - TEMPERATURE (°F) GUIDELINES

The maximum pressure rating of any TVI Thermoplastic Valve is 150 PSI @72° F - water, nonshock. With temperature increase, the pressure capability of each type valve and size must be derated as charted below.

Ball Valves:
Compact Style,
True Union,
Econo-Pro.

**Ball Check &
Foot Valves,
Gauge Valves.**



Butterfly Valves

BODY	DISC	TEMP. (°F)	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
PVC	PP	32 - 70	150	150	150	150	150	150	150	150	100	100	85	70	50	50
		120	100	100	100	100	100	100	100	100	60	60	60	30	30	30
		140	70	70	70	45	45	45	40	30	30	30	30	20	20	20
PVDF	PVDF	-40 - 250	150	150	150	150	150	150	100	60	60	40	40	40	40	40

Horizontal Swing Check Valves

SIZE \ TEMP (°F)	Horizontal Swing Check Valves													
	PVC				PP				PVDF					
	EPDM		TEFLON		EPDM		TEFLON		EPDM			TEFLON		
	32-70	110	120	32-120	-5-110	140	180	-5-110	-5-140	180	195	210	-5-210	
3/4"	150	150	100	40	150	100	90	40	150	120	100	85	85	
1"	150	150	100	40	150	100	90	40	150	120	100	85	85	
1 1/2"	150	150	100	40	150	100	90	40	150	120	100	70	85	
2"	150	150	100	40	150	100	80	40	150	120	90	55	85	
2 1/2"	150	100	100	40	100	85	70	35	150	100	80	50	85	
3"	150	100	100	40	100	70	60	30	150	100	80	40	70	
4"	100	70	70	30	70	65	40	30	100	85	60	35	70	
5"	100	70	70	30	70	50	35	30	100	85	60	30	60	
6"	100	70	60	25	70	40	30	20	100	70	60	30	40	
8"	70	40	40	20	40	35	25	15	70	50	40	30	40	

Diaphragm Valves

VALVE SIZE	RUBBER DIAPHRAGM @ 73°F					TEFLON DIAPHRAGM @ 73°F				
	PVC	PP	PPG	CPVC	PVDF	PVC	PP	PPG	CPVC	PVDF
	1/2"	150	150	150	150	150	105	105	105	105
3/4"	150	150	150	150	150	105	105	105	150	105
1"	150	150	150	150	150	105	105	105	150	105
1 1/2"	150	150	150	150	150	105	105	105	105	105
2"	150	150	150	150	150	105	105	105	105	105
2 1/2"	150	150	150	150	150	105	105	105	105	105
3"	150	150	150	150	150	90	75	90	90	90
4"	150	150	150	150	150	90	75	90	90	90
5"	105	105	105	105	105	60	60	60	60	60
6"	105	105	105	105	105	60	60	60	60	60
8"	60	60	60	60	60	45	45	45	45	45
10"	60	45	60	60	60	45	45	45	45	45

NOTE: TEFLON IS A REGISTERED TRADEMARK OF DUPONT DOW ELASTOMERS

CV VALUES OF TVI VALVES

TYPE & SIZE	SAFETY BLOCK T.U. & COMPACT BALL VALVES 1/2"-2" 6" STRONG UNION	BUTTERFLY VALVES	SWING CHECK VALVES	BALL CHECK VALVES	Y SEDIMENT STRAINERS	DIAPHRAGM VALVES 1/2" - 2" T.U. STYLE 2 1/2"-10" FLANGED IPC. BODY STYLE
1/2"	14			10	3.2	6.0
3/4"	30		25	25	5.8	11.0
1"	44		25	38	8.0	17.8
1 1/4"	80			76	18.5	
1 1/2"	130		80	80	20.0	35.0
2"	185	105	115	152	30.0	78.0
2 1/2"	330	260	250	280		125.0
3"	450	385	330	312		162.0
4"	730	520	500	525		275.0
5"		775	750			
6"	1390	1200	1200	1215		690.0
8"		2065	2000			1050.0
10"		3750		3800		1810.0
12"		5200				
14"		6450				
16"		8375				
18"		11000				
20"		14200				
24"		18750				

Cv value is the number of U.S. GPM of water at 73 degrees F that pass through the fully open valve at a pressure drop of 1 PSI.

THERMOPLASTIC VALVES, INC.
TORQUE INFORMATION/TORQUE REQUIRED IN INCH
POUNDS INCLUDING 30% SAFETY FACTOR

SIZE	150 PSI	100 PSI	50 PSI
BUTTERFLY VALVES			
2"	125	95	65
2 1/2"	195	125	85
3"	310	195	130
4"	510	325	195
5"	700	435	253
6"	700	435	253
8"	1100	850	365
10"	2375	1440	965
12"	3900	2630	2200
14"		7700	3450
16"		88 PSI 8400	4615
18"		74 PSI 11,400	5635
20"			8075
24"			11,000
TUSB BALL VALVES			
1/2"	65	45	20
3/4"	72	45	26
1"	90	60	33
1 1/4"	195	124	65
1 1/2"	195	124	65
2"	210	130	80
2 1/2"	255	145	98
3"	390	195	130
4"	630	290	195
DIAPHRAGM TU VALVES			
1/2"	78	50	20
3/4"	88	52	20
1"	98	58	26
1 1/2"	124	78	52
2"	188	118	65
DIAPHRAGM FLG. BODY VALVES			
1"	78		
2"	98		
3"	135		
4"	325		
6"		358	125
8"			60PSI 425
10"			60PSI 560

THERMOPLASTIC VALVES, INC. WEIGHTS IN POUNDS & OUNCES (EST. SHIPPING WEIGHT) PVC WEIGHTS ONLY

TYPE	SIZE	EACH CARTON (LOT)	
BC	1/2" SOC./THD.	0.2	15.2 (50)
BC	1/2" FLANGED	0.6	
BC	3/4" SOC./THD.	0.6	22.8 (40)
BC	3/4" FLANGED	1.0	
BC	1" SOC./THD.	0.6	14.6 (20)
BC	1" FLANGED	1.4	
BC	1 1/4" SOC./THD.	1.2	17.0 (12)
BC	1 1/4" FLANGED	2.0	
BC	1 1/2" SOC./THD.	1.2	15.8 (12)
BC	1 1/2" FLANGED	2.4	
BC	2" SOC./THD.	1.8	24.2 (12)
BC	2" FLANGED	4.0	
BC	2 1/2" SOC./THD.	6.4	27.2 (4)
BC	2 1/2" FLANGED	9.2	
BC	3" SOC./THD.	11.8	49.4 (4)
BC	3" FLANGED	15.6	
BC	4" SOC./THD.	16.4	34.8 (2)
BC	4" FLANGED	21.4	
BC	6" FLANGED	57.0	62.0 (1)
BC	10" FLANGED	179.0	230.0 (1)
BF	2" LEVER	3.0	40.8 (12)
BF	2 1/2" LEVER	4.2	48.0 (12)
BF	3" LEVER	4.6	53.0 (12)
BF	4" LEVER	6.6	37.6 (6)
BF	5" LEVER	12.0	47.6 (4)
BF	6" LEVER	14.0	55.4 (4)
BF	8" LEVER	22.4	41.0 (2)
BF	8" GEAR	28.0	30.0 (1)
BF	10" GEAR	32.0	35.0 (1)
BF	12" GEAR	72.0	75.0 (1)
BF	14" GEAR	CRATE	114.0 (1)
BF	16" GEAR	CRATE	130.0 (1)
BF	18" GEAR	CRATE	165.0 (1)
BF	20" GEAR	CRATE	195.0 (1)
BF	24" GEAR	CRATE	260.0 (1)
UBF	2" LEVER	2.8	22.6 (1)
UBF	3" LEVER	4.0	30.9 (6)
UBF	4" LEVER	5.8	22.8 (3)
UBF	6" LEVER	11.4	27.8 (2)
UBF	8" LEVER	17	30.6 (1)
CB	1/2" SOC./THD.		28.6 (120)
CB	3/4" SOC./THD.	0.4	31.2 (90)
CB	1" SOC./THD.	0.4	31.8 (60)
CB	1 1/4" SOC./THD.	0.6	27.8 (40)
CB	1 1/2" SOC./THD.	1.2	34.0 (30)
CB	2" SOC./THD.	1.6	31.0 (18)
CB	3" SOC./THD.	5.4	41.0 (6)
CB	4" SOC./THD.	7.2	37.0 (4)

BC = BALL CHECK
BF = BUTTERFLY VALVE
CB = COMPACT BALL VALVE
TUDV = TRUE UNION DIAPHRAGM
DV = FLANGED DIAPHRAGM

HS = HORIZONTAL SWING CHECK
PV = POOL VALVE
SB = SAFTEY BLOCK BALL VALVE
UB = UNIV. BFV
YS = Y-STRAINER

TYPE	SIZE	EACH	CARTON (LOT)
TUDV	1/2" SOC./THD.	1.2	16.8 (12)
TUDV	1/2" FLANGED	1.8	
TUDV	3/4" SOC./THD.	1.2	16.4 (12)
TUDV	3/4" FLANGED	1.8	
TUDV	1" SOC./THD.	1.8	23.8 (12)
TUDV	1" FLANGED	2.6	
TUDV	1 1/2" SOC./THD.	4.0	26.6 (6)
TUDV	1 1/2" FLANGED	5.2	
TUDV	2" SOC./THD.	6.4	41.2 (6)
TUDV	2" FLANGED	8.4	
DV	2" MLD. BODY FLG.	9.0	9.0 (1)
DV	3" MLD. BODY FLG.	15.2	15.2 (1)
DV	4" MLD. BODY FLG.	23.8	23.8 (1)
DV	6" MLD. BODY FLG.	57.6	81.6 (1) CRATE
DV	8" MLD. BODY FLG.	86.6	115.4 (1) CRATE
DV	10" MLD. BODY FLG.		154.0 (1) CRATE
HS	3/4"	4.0	(1)
HS	1"	4.2	(1)
HS	1 1/2"	6.2	(1)
HS	2"	8.8	(1)
HS	2 1/2"	8.8	(1)
HS	3"	9.2	(1)
HS	4"	16.2	(1)
HS	6"	34.8	(1)
HS	8"	52.2	(1)
PV	2" SOC. (3 WAY)	2.4	29.6 (12)
SB	1/2" SOC./THD.	0.06	30.2 (48)
SB	1/2" FLANGED	1.0	
SB	3/4" SOC./THD.	1.0	36.0 (36)
SB	3/4" FLANGED	1.6	
SB	1" SOC./THD.	1.	47.8 (36)
SB	1" FLANGED	2.0	
SB	1 1/4" SOC./THD.	3.2	40.0 (12)
SB	1 1/4" FLANGED	4.2	
SB	1 1/2" SOC./THD.	3.0	38.4 (12)
SB	1 1/2" FLANGED	4.2	
SB	2" SOC./THD.	4.4	55.8 (12)
SB	2" FLANGED		
SB	2 1/2" SOC./THD.	6.8	29.4 (4)
SB	2 1/2" FLANGED	9.6	
SB	3" SOC./THD.	12.6	27.0 (2)
SB	3" FLANGED	16.4	
SB	4" SOC./THD.	17.8	(1)
SB	4" FLANGED	22.6	
SB	6" STRONG UNION FLG.	39.2	(1)
SB	4-6" VENT. SOC.	25.8	
SB	4-6" VENT. FLG.	32.2	
YS	1/2" SOC./THD.	0.4	
YS	3/4" SOC./THD.	0.8	
YS	1" SOC./THD.	1.2	
YS	1 1/4" SOC./THD.	2.2	
YS	1 1/2" SOC./THD.	2.6	
YS	2" SOC./THD.	3.8	

THERMOPLASTIC VALVE INSTALLATION INSTRUCTIONS

VALVE STORAGE

Thermoplastic valves should be stored indoors at ambient temperature in their original containers to keep them clean to avoid damage and elastomeric deterioration.

END CONNECTIONS

SOCKET: Provides a stronger connection than threading and is preferred in permanent installations. Socket dimensions are in conformance with ASTM D2467.

SOLVENT CEMENTED: Compatible with PVC and CPVC Valves, using normal solvent cementing techniques. Caution should be taken that cement does not get on the inside face of the end connection or inside the valve. Refer to cement manufacturer's guidelines for bonding temperature limitations and recommended cementing cure times.

NOTE: Shelf life of solvent cement is limited to the time advised by the manufacturer. That is approximately one year for CPVC and two years for PVC.

SOCKET FUSION (THERMAL BONDING): The superb resistance of PVDF and PP to organic solvents, including solvent cements make it necessary to join those socket connections, in 1/2" thru 4" sizes, by thermal bonding technique.

BUTT FUSION (THERMAL BONDING): A heat fusion technique necessary for joining PVDF and PP butt end connections to similar material piping.

THREADED: Preferred when occasional disconnecting of piping system is necessary, but limited to a maximum of 4 inches in diameter. Thermoplastic pipe of Schedule 80 or heavier should be used because threading reduces the effective wall thickness, resulting in a reduction in pressure rating to one-half that of solvent cemented or thermal bonded socket connections. Threads are American Standard Tapered Pipe Threads per ANSI B2.1.

Preparation for assembly consists of wrapping the pipe threads with Teflon (TFE) tape, starting with the second thread from the end and wrapping in the direction of threads, with a slight overlap. After a hand-tight assembly, an additional 1/2 to 1-1/2 turns with a strap wrench will complete the connection. Care must be taken to not overtighten, which can cause distortion or even failure of threads.

FLANGED: Manufactured to ANSI B16.5, (150lb. class). Available in most all sizes and most widely used throughout the industry for process systems that require occasional dismantling. Thermoplastic flanges may be connected to pipe or fitting by the method required by the individual material. A full flat face elastomeric gasket seal of a 50 to 70 durometer hardness, is required between flanges, with the exception of Butterfly Valves in which the outer face of the seal acts as the gasket.

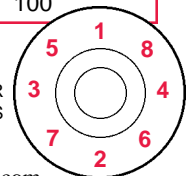
JOINING FLANGES:

1. Carefully observe for proper alignment of bolt holes, and also for parallelity and closeness of mating flanges.
2. Position gasket seal. Then insert and lubricate all bolts, using flat washers under bolt heads and nuts.
3. With a wrench on bolt head, tighten each nut with a torque wrench in a pattern, diametrically opposite each other, as shown below. Do this in increments until finally reaching the torque values charted at right.

FLANGE SIZE (IN.)	RECOMMENDED TORQUE (FT. LBS.)*
1/2"-1 1/2"	10-15
2-4	20-30
5-8	30-45
10	50-75
12	80-110
14-24	100

* For a well lubricated bolt, recommended

TIGHTENING PATTERN FOR FLANGE BOLTS



VALVE ADJUSTMENTS AND INSTALLATION GUIDE

COUPLING NUTS: On all true union style valves when installing into pipe line, nuts should be tightened by hand. It is not recommended to use pipe or strap wrench.

SAFTEY BLOCK TRUE UNION BALL VALVES: Adjustment for ball to seat tightness:

- (a) Sizes 1/2" thru 4" - Remove coupling nut on adjusting end of valve. Use valve handle on threaded cartridge and turn 20° clockwise. Replace coupling nut hand tight.
- (b) Sizes 3" and 4" - It is only necessary to tighten the adjustment end coupling nut. Do not over-tighten or handle will not turn valve from open to close position.

BALL CHECK VALVE: No adjustment is required other than making certain that the union nuts are tight. Install in line with the flow arrow in the same direction as the fluid flow. **Caution** should be taken not to install a Ball Check too close to a discharge pump. The resulting turbulent fluid flow may cause ball chatter and internal valve damage.

BUTTERFLY VALVE: Always install between two pipe flanges, and never with a gasket seal. The outer rim of the elastomeric valve seal acts as the gasket seal.

DIAPHRAGM VALVE:

Installation:

1. Refer to section "Joining Flanges" and follow written procedures.
2. Sizes 3" and larger have a bonnet grease fitting. Lubricate before placing valve in service.
3. Use torque wrench, follow same recommended torques shown for flange bolt connections and tighten body/bonnet bolting.
4. Full open flow setting has been set at factory before factory pressure testing.

Maintenance:

1. The TVI thermoplastic diaphragm valves require no maintenance other than periodic grease fitting lubrication.

OPERATING & MAINTENANCE GUIDE FOR TVI VALVES

SAFETY BLOCK TRUE UNION BALL VALVES

- OPERATING:** Manual handle control, arrow on top of handle gives direction for open and close positions.
- MAINTENANCE:** The valve requires no maintenance. If seat or surface of ball wears, due to abrasion and valve does not shut off tightly, valve can be adjusted.
- ADJUSTMENT:** On valve sizes 1/2" through 4" the operating handle is the tool for tightening the adjusting cartridge (seat carrier part No. 4). Remove body from pipe line by loosening coupling nuts. Remove handle from stem. Place handle hub into seat carrier and give quarter turn clockwise. Reassemble valve and reconnect to pipe line.
- On sizes 2 1/2" and 3" use same method but do not remove handle. Use common spanner wrench to turn seat carrier the quarter turn.

COMPACT BALL VALVES

- OPERATING:** Manual handle control, arrow on top of handle gives direction for open and close positions.
- MAINTENANCE:** The valve requires no maintenance. Valve cannot be adjusted. When materials wear and valve begins to leak, valve must be replaced.

BUTTERFLY VALVES

- OPERATING:** Lever type manual operation. The handle position is the indicator of the blade position in the body. When the lever handle is perpendicular to the pipe line, the blade is in the closed position. If the lever handle is parallel to the pipe line the valve is open.
- IMPORTANT:** The handle has a ten position locking plate. The lever part No. 16 must be disengaged from the locking plate before moving the handle part No. 13 to position desired.
- OPERATING:** Manual Gear type with handwheel or chainwheel. Revolving indicator plate mounted on top of gear box moves to indicate the position of the blade. Mechanical stops are furnished. They can be adjusted to increase or decrease travel into open or closed position.
- MAINTENANCE:** No maintenance required. If valve is to be stored for any length of time, it should be stored in dark and cool condition to lengthen the shelf life of the full faced elastomeric liner seat. Also in outside pipe lines exposed to sun light precautions should be taken to eliminate

valve failures. Expansion joints in the pipe line are necessary to combat pipe expansion causing crushing and fracturing the flanged portion of the full faced elastomeric liner. This will push the rubber into the seating area and bind the operation of the valve. If an outdoor pipe line subject to direct sun light is not normally conveying flow materials the heat can deteriorate the elastomeric liner and shorten life of valve seat.

Manual Gear type operator should be repacked with axle grease every 18 to 24 months. Remove indicator cap Part No. 11 and then the top cap Part No. 9. Pack gears with normal amount of axle grease and reassemble.

HORIZONTAL SWING CHECK/BALL CHECK VALVES

OPERATING: The flow material direction operates the valve. The valve will close under back pressure of flow material.

MAINTENANCE: Periodic maintenance is not required. If parts wear and need replacing the Horizontal Swing Check valve does not need to be removed from piping system. It is necessary to shut off line pressure. Remove valve bonnet and shaft holder bolt and all parts can be easily removed. The ball check valve requires the loosening of the coupling nut.

DIAPHRAGM VALVES

OPERATING: All size valves are equipped with a handwheel for controlling flow. Valves can be pneumatically or electrically operated as an option.

MAINTENANCE: 1/2" through 2" True Union Diaphragm Valves require no maintenance. Flanged valves 3" through 10" have a grease fitting on the bonnet. Standard axle grease should be injected one time every 18 months. Replacing rubber or TFE diaphragm requires removing bonnet and unscrewing diaphragm. When replacing new diaphragm be sure to have seating cross bead directly above body seating ridge. The body seating ridge runs perpendicular to flow stream.

6" STRONG UNION BALL VALVE

OPERATING: Manual handle indicates open and closed position of valve.

MAINTENANCE: If valve leaks because of seat wear, seats can be replaced by removing nuts and bolts and removing worn seats. Valve may also leak because of worn seals. They can also be replaced. After removing nuts and bolts ball can be turned sideways and removed from stem. Stem can then be removed and seals replaced on the stem if necessary. When replacing nuts and bolts make sure that all are tightened to the same degree for bubble-tight shutoff.

ADJUSTMENT: This valve cannot be adjusted for seat wear. Seats must be replaced.

PROBLEMS AND SOLUTIONS FOR DIAPHRAGM VALVES

PROBLEMS	POSSIBLE REASONS	SOLUTIONS
1. VALVE LEAKS PAST SEATING AREA	Diaphragm not closing fully.	Un screw gauge cover. Attach wrenches on both the stopper (part No. 16) and the set nut (part No. 17). Turn both parts one full turn counter-clockwise, moving parts toward top of threaded shaft. Replace gauge cover.
2. HANDWHEEL SPINS FREELY, VALVE DOES NOT CLOSE OR OPEN.	Compressor Pin (part No. 9) has probably sheared due to excessive turning of handwheel past the open or closed position	Remove bonnet assembly from body. Tap compressor pin through drilled hole. Replace with new pin. Reassemble bonnet to body. Caution: Be positive bonnet position has raised seating bead located over body seating ridge before bolting bonnet to body.

PROBLEMS AND SOLUTIONS FOR HORIZONTAL SWING CHECKS

PROBLEMS	POSSIBLE REASONS	SOLUTIONS
1. BROKEN SHAFT OR SWING ARM	Hammer blow	Replace with new parts and remedy hammer blow condition

PROBLEMS AND SOLUTIONS FOR BUTTERFLY VALVES

PROBLEMS	POSSIBLE REASONS	SOLUTIONS
1. BROKEN LEVER	Attempting to open or close valve without releasing locking position trigger. Forcing lever past the full open or fully closed position. Lever hit by external object	Replace with new lever " " " "
2. BLADE JAMMED (CANNOT OPEN OR CLOSE)	Obstruction Thermal expansion of pipe line caused by quick change of temperature has crushed flange portion of liner into body and excess rubber has bound blade.	Disconnect flanges from wafer type valve and inspect pipe. Check liner seat for bulging areas where compression on flange area of liner seat has been forced into body area. Possible liner replacement will be necessary. Add expansion joints in piping system. " " " " "
3. VALVE LEAKS INTERNALLY	Check temperature versus pressure tables. Valve materials not suitable for service. Flow media too abrasive, worn disc, or elastomer seat wear.	Replace with proper materials. Replace with proper materials.

PROBLEMS AND SOLUTIONS FOR BALL CHECK VALVES

PROBLEMS	POSSIBLE REASONS	SOLUTIONS
1. BROKEN BALL OR BROKEN SEAT AREA	Hammer blow	Replace with new parts and remedy hammer blow condition

PROBLEMS AND SOLUTIONS FOR SAFETY BLOCK TRUE UNION BALL VALVES

PROBLEMS	POSSIBLE REASONS	SOLUTIONS
1. BROKEN HANDLE	Adjusting cartridge too tight. Struck by external object.	Loosen coupling nuts. Remove body from pipe line. Use handle or spanner wrench as tool to loosen adjusting cartridge Turn cartridge 1/4 turn counter clockwise. Replace in pipe line after installing new handle.
2. VALVE BEGINS TO LEAK INTERNALLY	Excessive seat wear.	Use same procedure as above but turn adjusting cartridge 1/6 turn clockwise.
3. VALVE BEGINS TO LEAK EXTERNALLY	Elastomer fatigue.	Replace in pipe line. Remove body of valve from pipe line. Replace O ring seal on both end connectors.
4. EXTERNAL LEAKING PAST STEM	Elastomer fatigue.	Remove valve body from pipe line. Remove adjusting cartridge. Remove handle and then push the ball out of the body. Push stem downward into body. Replace O ring seal or seals and reassemble.

PROBLEMS AND SOLUTIONS FOR STRONG UNION BALL VALVES

PROBLEMS	POSSIBLE REASONS	SOLUTIONS
1. HANDLE TURNS BUT BALL DOES NOT OPEN OR CLOSE	Broken stem.	Disassemble valve and replace with new stem.
2. VALVE BEGINS TO LEAK INTERNALLY	Excessive seat wear.	Use same procedure as above but turn adjusting cartridge 1/6 turn clockwise. Replace in pipe line.
3. VALVE BEGINS TO LEAK EXTERNALLY	Elastomer fatigue.	Remove body of valve from pipe line. Replace O ring seal on both end connectors.
4. EXTERNAL LEAKING PAST STEM	Elastomer fatigue.	Remove valve body from pipe line. Remove adjusting cartridge. Remove handle and then push the ball out of the body. Push stem downward into body. Replace O ring seal or seals and reassemble.

All parts are readily available in TVI inventory.

COMPACT BALL VALVE

The Compact Ball Valve is an inexpensive valve and cannot be adjusted. When valve does not function correctly due to low abrasion or elastomer fatigue, valve must be replaced.



THERMOPLASTIC VALVES INC.

BALL CHECK VALVE AND BALL CHECK FOOT VALVE ASSEMBLY

SIZE: 1/2" - 4"

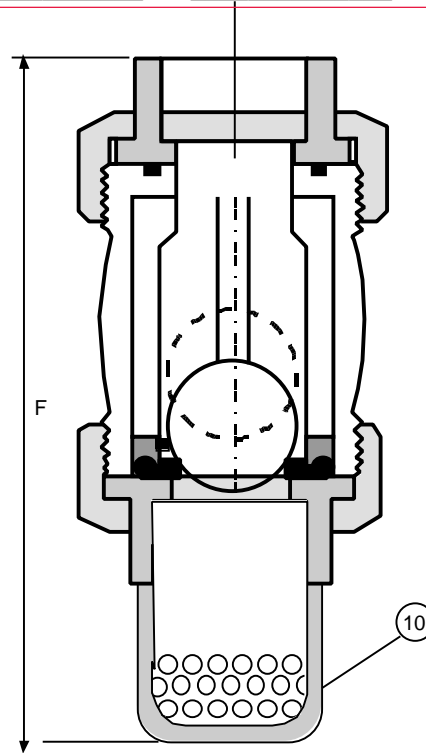
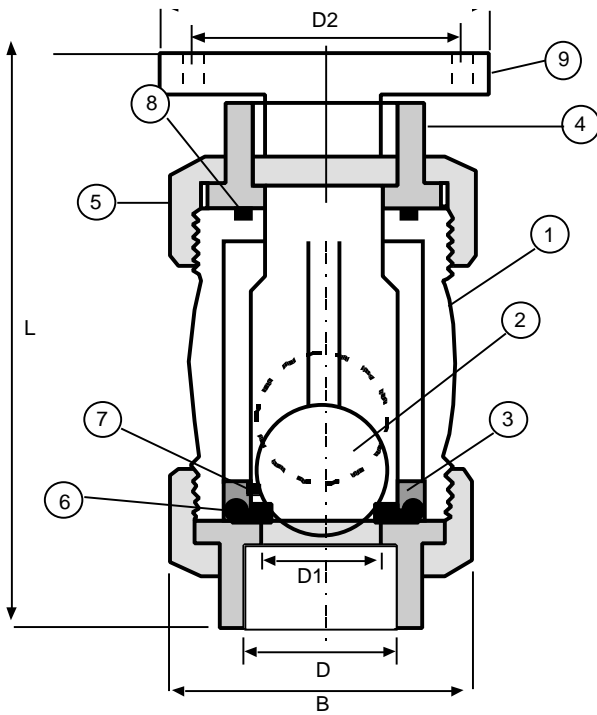
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- Less Than 1 PSI Pressure to Operate
- Operates in Vertical or Horizontal Installations
- One Piece Seat & Seal
- Excellent Flow Characteristics

Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials
1	Body	1	PVC,PP,PVDF,CPVC	6	Seat	1	EPDM,VITON®
2	Ball	1	PVC,PP,PVDF,CPVC	7	Seat Carrier O-Ring	1	EPDM,VITON®
3	Seat Carrier	1	PVC,PP,PVDF,CPVC	8	Solid End O-Ring	1	EPDM,VITON®
4	Connector	2	PVC,PP,PVDF,CPVC	9	Flanged Cut	1	PVC, PP, PVDF,CPVC
5	Union Nut	2	PVC,PP,PVDF,CPVC	10	Foot Valve Assembly	1	PVC

VITON® is a trademark of Dupont Dow Elastomers.

Ansi Dimensions

Size Inch	D ₁	Socket	D Screw	Socket	L Screw	FLG'D	B	D ₂	F	Working Pressure (PSI)
1/2"	0.598	0.840	NPT 1/2"	3.976	3.976	5.75	2.106	2.375	5.50	150
3/4"	0.771	1.050	NPT 3/4"	4.527	4.527	6.25	2.492	2.750	6.50	150
1"	0.984	1.315	NPT 1"	5.354	5.354	7.25	2.875	3.125	7.50	150
1 1/4"	1.259	1.660	NPT 1 1/4"	6.732	6.732	9.00	3.842	3.500	9.75	150
1 1/2"	1.574	1.900	NPT 1 1/2"	6.732	6.732	9.00	3.842	3.875	9.75	150
2"	1.968	2.375	NPT 2"	7.677	7.677	10.18	4.744	4.750	10.75	150
2 1/2"	2.559	2.875	NPT 2 1/2"	8.740	8.740	11.75	6.00	5.500	12.25	150
3"	3.150	3.500	NPT 3"	10.787	10.787	13.125	7.25	6.000	14.75	150
4"	3.937	4.50	NPT 4"	14.449	14.449	17.125	8.00	7.50	19.75	150

TVI BALL CHECK VALVES (1/2" - 4")

DESIGN SPECIFICATIONS

Thermoplastic Ball Check Valves (1/2" - 4") are of all thermoplastic construction. Body has full length ribs for maximum flow, minimum pressure drop, and to eliminate ball sticking and chatter. Ball is of solid thermoplastic material. Seat is full circle and resilient. A molded gasket seal and seat enlarges seating surface and facilitates maintenance. Valves require less than one (1) PSI to open and 3 -5 PSI to close drop tight. Valves are capable of installation in either vertical or horizontal pipe run. Valves are readily adaptable for foot valve service with the addition of a screen assembly. Materials of construction shall be as follows: (select as required for service)

BODY/UNION NUT / END CONNECTORS

PVC,CPVC, ASTM D-1784
PP, ASTM D-4101
PVDF, ASTM D-3222

BALL

PVC,CPVC, ASTM D-1784
PP,ASTM D-4101
PVDF,ASTM D-3222

SEAT/SEAL

EPDM, Ethylene - Propylene Diene Monomer
Fluorocarbon - Viton (Dupont Dow Elastomers)
Fluorel (3M Corp.)

End connectors shall conform to the following standards:

SOCKET

ASTM - D-2467 (PVC,SCH-80)
ASTM, F-437 (CPVC, SCH-80)

THREADED

ASTM - D-2464 (PVC, SCH-80)
ASTM - F-437 (CPVC, SCH-80)

FLANGED

ANSI - B16.5 Class 150

Not recommended for compressed air or gas service.



THERMOPLASTIC VALVES INC.

6" & 10" CHECK VALVES

SIZE: 6" & 10"

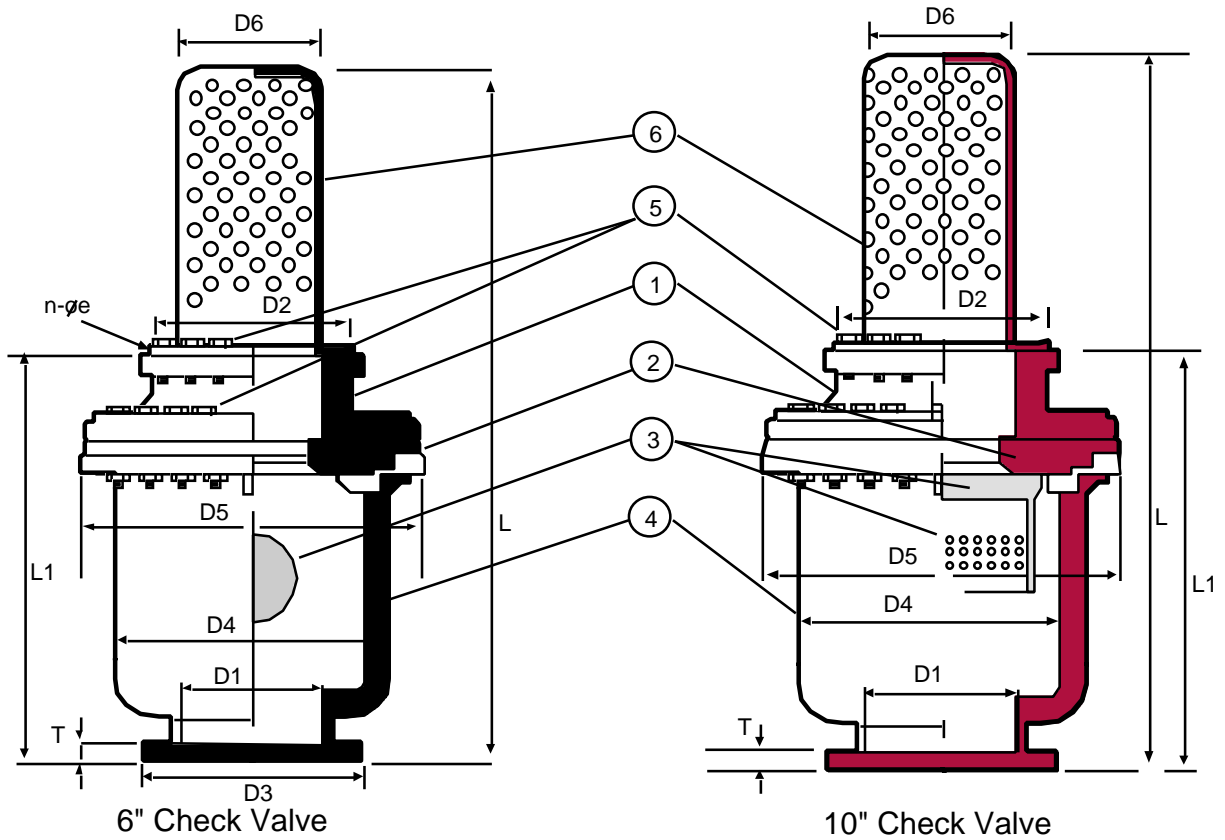
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Materials of Construction

Item	Parts	Pcs	Materials
1	Flange End	1	6" PVC (10"-PPG)
2	Seal	1	EDPM, VITON®
3	Ball (6") screen (10")	1	6" PVC(10"-PVDF)
4	Body	1	6" PVC(10"-FRP)
5	Hardware		304 SS
6	Foot Valve Assembly	1	PVC

VITON® is a trademark of Dupont Dow Elastomers.

Ansi Dimensions

Size Inch	D1	D2	D3	n	e	L	T	D4	D5	D6	L1	Working Pressure (PSI)
6"	5.91"	9.49"	11.10"	8	0.87	30.94"	0.91"	9.37"	14.37"	6.59"	18.70"	85
10"	9.48"	14.17"	16.14"	12	0.91	46.85"	1.34"	19.21"	23.62"	10.51"	27.05"	42

TVI BALL CHECK VALVES (6" AND 10")

DESIGN SPECIFICATIONS

Ball Check Valves (6") are of all thermoplastic construction, 10" bodies are fiberglass. The Body has full length ribs for maximum flow, minimum pressure drop, and to eliminate ball sticking and chatter. Ball is of solid thermoplastic material in 6" size. In 10" size screen is PVDF. Seat is full circle and resilient. A molded gasket seal and seat enlarges seating surface and facilitates maintenance. Valves require less than one (1) PSI to open and 3 -5 PSI to close drop tight. Valves are capable of installation in either vertical or horizontal pipe run. Valves become foot valves by attaching a screen assembly.

BODY/UNION NUT / END CONNECTORS

PVC, ASTM D-1784
PP, ASTM D-4101
PVDF, ASTM D-3222
FRP, ASTM

BALL/SCREEN

PVC, ASTM D-1784
PP, ASTM D-4101
PVDF, ASTM D-3222

SEAT/SEAL

EPDM, Ethylene - Propylene Diene Monomer
Fluorocarbon - Viton (Dupont Dow Elastomers)
Fluorel (3M Corp.)
End connectors shall conform to the following standards:

FLANGED ONLY

ANSI - B16.5 Class 150

Not recommended for compressed air or gas service.

TVI THERMOPLASTIC VALVES INC.

ARRANGEMENT DRAWING

WAFER STYLE BUTTERFLY VALVE FOR ANSI FLANGES

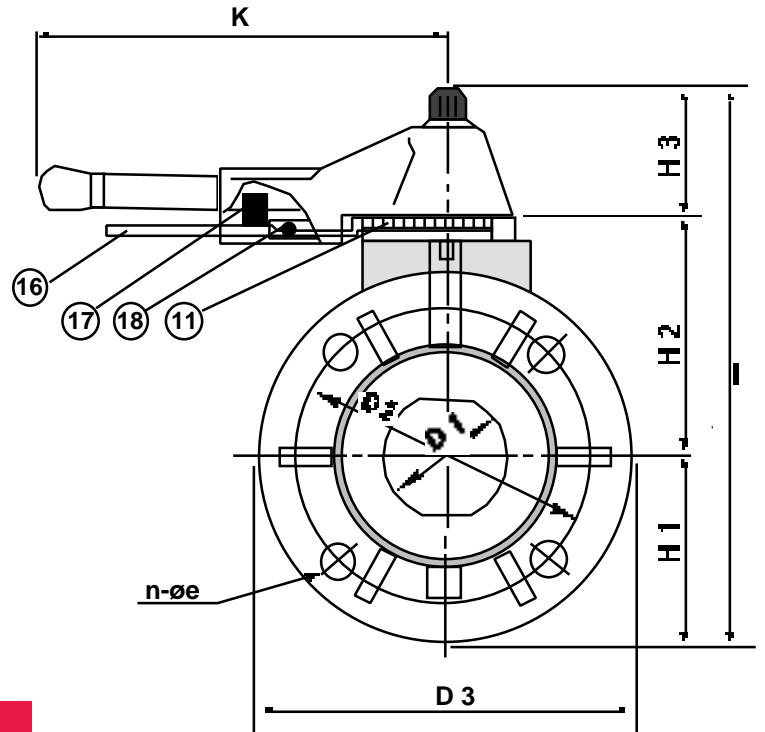
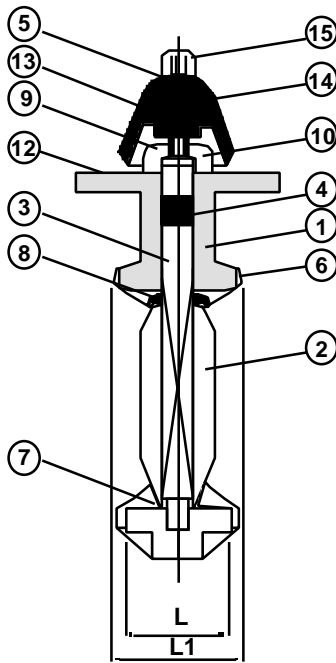
SIZE: 2" - 8"

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Ansi Dimensions

Size Inch	D1	D2	D3	e	n	L	L1	H1	H2	H3	I	K	Test Press (PSI)		Working Press (PSI)
													Body	Seat	
2"	2.24	4.75	6.54	0.75	4	1.38	1.65	3.27	4.01	2.68	9.96	8.66	222	177	150
2 1/2"	2.75	5.50	7.24	0.75	4	1.46	1.81	3.62	4.33	2.68	10.63	8.66	222	177	150
3"	3.15	6.00	7.87	0.75	4	1.46	1.81	3.94	4.64	2.68	11.26	8.66	222	177	150
4"	4.01	7.50	9.06	0.75	8	1.85	2.20	4.53	5.28	2.68	12.48	8.66	222	177	150
5"	5.12	8.50	10.00	0.87	8	2.24	2.60	5.00	6.30	3.78	15.08	12.20	222	177	150
6"	6.02	9.50	11.42	0.87	8	2.44	2.80	5.71	6.97	3.78	16.46	12.20	222	177	150
8"	7.99	11.75	13.27	0.87	8	2.99	3.43	6.61	8.03	3.66	18.31	16.30	222	177	150

Testing performed on PVC/PP/EPDM valves at 73°F water temperature, non-shock.

Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials
1	Body	1	PVC,PP,PVDF, CPVC*	10	Retainer Cap	1	PVC,PP, CPVC, PVDF
2	Disc	1	PVC,PP,PVDF, CPVC*	11	Positioner	1	SUS304, 8" Use SS41
3	Stem	1	SUS410,SUS304,SUS316	12	Screw	3	SUS304
4	Stem O'ring	2	EPDM,VITON®, BUNA N	13	Handle	1	ABS
5	Washer	1	SUS304	14	Inserted Metal of Handle	1	CS
6	Seat	1	EPDM,VITON®, BUNA N	15	Nut	1	PVC COATED BRASS, SUS304
7	Disc O'Ring	2	EPDM,VITON®, BUNA N	16	Hand Lever	1	SUS 304,SUS41
8	Disc O'Ring	2	EPDM,VITON®, BUNA N	17	Spring	1	SUS304
9	Stem Retainer	1	SUS304	18	Set Pin	1	BRASS

*CPVC available to 12"

VITON® is a trademark of Dupont Dow Elastomers

TVI BUTTERFLY VALVE (2" - 8")

DESIGN SPECIFICATIONS

Thermoplastic Butterfly Valves 2"-24" are wafer style to fit between ANSI B16.5 Class 150 flanges. Disc is smooth and contoured for lowest possible pressure drop (highest Cv). Shaft is 410 S.S. and of one piece, through shaft design, with square drive through entire length of blade. 2" - 8" valves shall be complete with a spring loaded 10-15 position latch lever. Seat liners shall be full faced with integral, ribbed flanges. No auxiliary gaskets shall be required for installation. Seat liners shall effectively isolate the body and shaft from the flow media. Seat liners shall also thermally insulate the body from the internal operating temperature. Valve liner and seals are replaceable. Materials of construction shall be: (select as required for service)

BODY

PVC,CPVC (available to 12"), ASTM D-1784,
PP, ASTM D-4101
PVDF, ASTM D-3222

DISC

PP, ASTM D-4101 (Standard 2" - 24" in PVC & PP valves)
PVC, CPVC, ASTM D-1784 (CPVC disc standard in CPVC valves)
PVDF, ASTM D-3222

SHAFT

ASTM A-240, TYPE 410 S.S. (Standard) 304 S.S., 316 S.S. and Titanium available

SEALS / SEAT

EPDM, Ethylene Propylene Diene Monomer
Fluorocarbon, Viton (Dupont Dow Elastomers)
Fluorel (3M Corp.)

HARDWARE

2" THRU 24" 304 S.S. 8" size positioner plate 410 S.S. Chrome Plated

LEVER

ABS, ASTM D-1788

GEAR BOX

Cast iron housing ASTM A -53, Epoxy coated

OTHER MATERIALS AVAILABLE UPON REQUEST.

Not recommended for compressed air or gas service

TVI THERMOPLASTIC VALVES INC.

ARRANGEMENT DRAWING BUTTERFLY VALVE-GEAR TYPE

SIZE: 8" - 24"

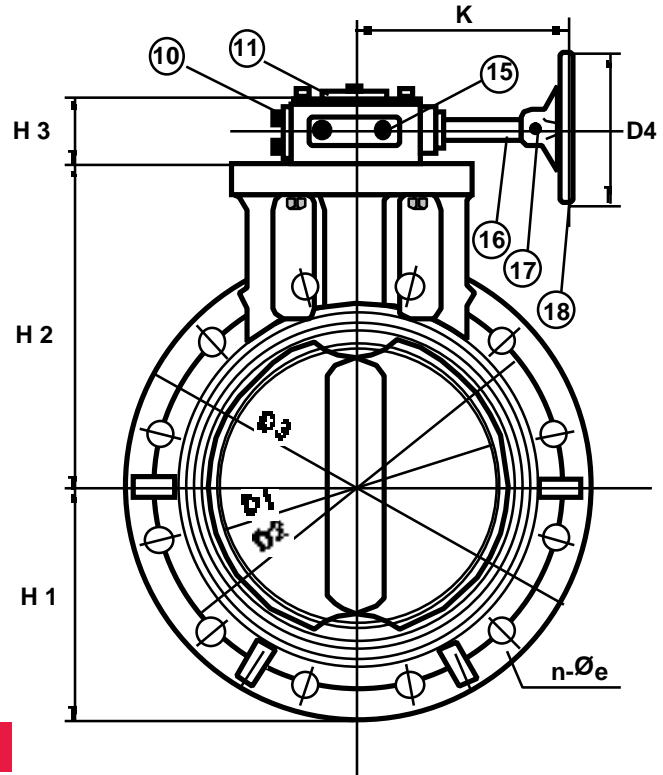
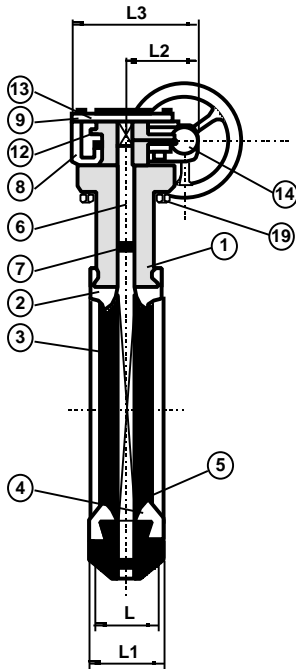
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Materials of Construction

Item	Parts	Pcs	Materials
1	Body	1	PVC,PP,PVDF, CPVC*
2	Seat	1	EPDM,VITON® BUNA N
3	Disc	1	PVC,PP,PVDF, CPVC*
4	Disc O-Ring (A)	2	EPDM,VITON®, BUNA N
5	Disc O-Ring (B)	2	EPDM,VITON®, BUNA N
6	Stem	1	SUS410, SUS304, SUS316
7	Stem O-Ring	2	EPDM,VITON®, BUNA N
8	Gear Box	1	C.I.
9	Gear Box Cap	1	C.I.
10	Side Cap	1	C.I.

*CPVC available to 12"

Item	Parts	Pcs	Materials
11	Indicator Plate	1	PVC
12	Gear	1	FORGEDSTEEL
13	Oil Seal	1	EPDM
14	Bearing	1	HEATTREATEDSTEEL
15	Adjustable Bolt	2	SS41
16	Gearing	1	SS41
17	Set Pin	1	STEEL
18	Hand Wheel	1	C.I.
19	Tightening Bolt	4	SUS304

VITON® is a trademark of Dupont Dow Elastomers.

Ansi Dimensions

Size Inch	D1	D2	n	Ø e	D3	L	L1	H1	H2	H3	K	L2	L3	D4	Test Press (PSI)		Working Press (PSI)
															Body	Seat	
8"	7.99	11.75	8	0.88	13.27	2.99	3.43	6.61	8.03	2.72	7.01	2.01	5.35	5.63	222	177	150
10"	10.00	14.25	12	0.98	15.75	3.78	4.37	7.87	9.25	2.72	7.01	2.01	5.35	5.63	222	177	150
12"	12.28	17.00	12	0.98	19.02	4.57	5.20	9.41	11.38	4.05	8.35	2.83	7.44	9.61	155	125	105
14"	14.09	18.75	12	1.14	20.47	4.57	5.20	10.20	12.01	4.05	8.35	2.83	7.44	9.61	155	125	105
16"	15.69	21.25	16	1.14	23.62	6.02	6.65	11.89	13.90	4.05	8.35	2.83	7.44	9.61	133	103	88
18"	17.75	22.75	16	1.26	25.20	6.54	7.13	12.48	14.37	4.76	10.59	4.57	11.22	18.27	111	88	74
20"	19.70	25.00	20	1.26	27.99	6.73	7.48	14.37	15.94	4.76	12.99	4.57	11.22	18.27	74	59	52
24"	23.66	29.50	20	1.38	32.00	7.52	8.23	16.73	18.11	4.76	12.99	4.57	11.22	18.27	74	59	52

Testing performed on PVC/PP/EPDM valves at 73°F water temperature, non-shock.

TVI BUTTERFLY VALVE (2" - 24")

DESIGN SPECIFICATIONS

Thermoplastic Butterfly Valves 2"-24" are wafer style to fit between ANSI B16.5 Class 150 flanges. Disc is smooth and contoured for lowest possible pressure drop (highest Cv). Shaft is 410 S.S. and of one piece, through shaft design, with square drive through entire length of blade. 2"-24" valves shall have epoxy coated gear actuators with handwheel. Seat liners shall be full faced with integral, ribbed flanges. No auxiliary gaskets shall be required for installation. Seat liners shall effectively isolate the body and shaft from the flow media. Seat liners shall also thermally insulate the body from the internal operating temperature. Valve liner and seals are replaceable. Materials of construction shall be: (select as required for service)

BODY

PVC,CPVC (available to 12"), ASTM D-1784,
PP, ASTM D-4101
PVDF, ASTM D-3222

DISC

PP, ASTM D-4101 (Standard 2" - 24" in PVC & PP valves)
PVC, CPVC, ASTM D-1784 (CPVC disc standard in CPVC valves)
PVDF, ASTM D-3222

SHAFT

ASTM A-240, TYPE 410 S.S. (Standard) 304 S.S., 316 S.S. and Titanium available

SEALS / SEAT

EPDM, Ethylene Propylene Diene Monomer
Fluorocarbon, Viton (Dupont Dow Elastomers)
Fluorel (3M Corp.)

HARDWARE

2" THRU 24" 304 S.S.

GEAR BOX

Cast iron housing ASTM A -53, Epoxy coated

OTHER MATERIALS AVAILABLE UPON REQUEST.

Not recommended for compressed air or gas service



THERMOPLASTIC VALVES INC.

WAFER STYLE UNIVERSAL BUTTERFLY VALVE

FOR ANSI FLANGES

SIZE: 2" - 8"

**DWN BY
CKP**

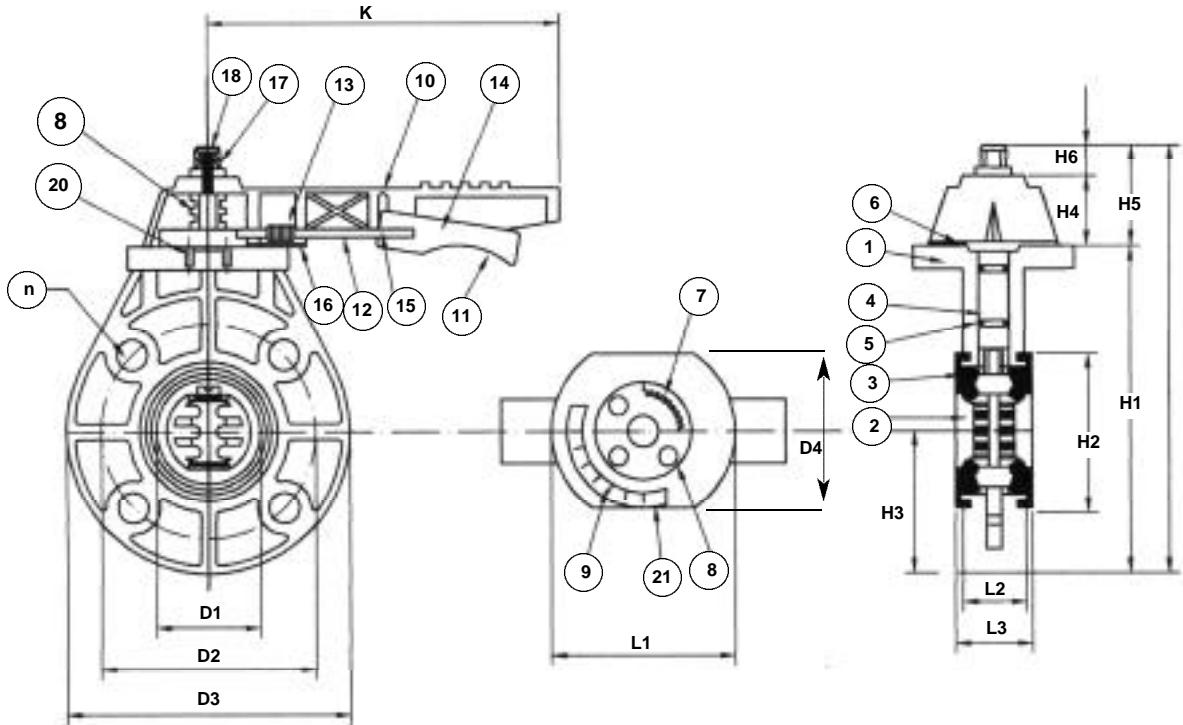
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**DWG NO.
220-BFV**



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Materials of Construction

Item	Parts	Pcs	Materials
1	Body	1	PVC,PP,PVDF,CPVC
2	Disc	1	PVC,PP,PVDF,CPVC
3	Seat	1	EPDM, VITON®, BUNA N
4	Stem	1	SUS 410, SUS 316
5	Stem O'ring	2	EPDM, VITON®, BUNA N
6	Washer	1	SUS 304
7	Positioner	1	SUS 304
8	Screw	3	SUS 304
10	Handle	1	ABS
11	Lever	1	ABS

Item	Parts	Pcs	Materials
12	Lever	1	SUS 410
13	Spring	1	SUS 410
14	Setpin (Long)	1	SUS 410
15	Setpin (Short)	1	SUS 410
16	Handle Cap	1	ABS
17	Stem Bolt	1	PVC, PP, PVDF, CPVC
18	Cap	1	PVC Coated Brass
19	Handle Insert	1	Casting Parts
20	Bolt	1	Brass, SUS 304
21	Bolt	1	SUS 304

VITON® is a trademark of Dupont Dow Elastomers.

Ansi Dimensions

Nom. size DN-Inch	D1	D2	D3	D4	n	L1	L2	L3	H1	H2	H3	H4	H5	H6	I	K
50 - 2"	2.16	4.84	6.46	3.66	4	4.13	1.50	1.61	7.44	3.31	3.23	1.69	2.48	0.68	9.84	7.95
80 - 3"	3.17	5.97	7.72	3.74	4	5.00	1.65	1.77	8.70	4.59	3.86	1.69	2.48	0.68	11.14	7.97
100 - 4"	3.94	7.16	8.85	3.89	8	5.27	1.89	2.0	9.92	5.59	4.43	1.85	2.68	0.84	12.55	9.92
150 - 6"	5.98	9.44	11.26	3.96	8	6.67	2.20	2.13	12.63	7.74	5.63	2.21	3.39	1.0	16.02	11.69
200 - 8"	7.87	11.70	13.54	4.31	8	7.52	2.40	2.52	15.12	10.12	6.77	2.21	3.39	1.0	18.50	11.69

TVI BUTTERFLY VALVE (2" - 8")

DESIGN SPECIFICATIONS

Thermoplastic Butterfly Valves 2"-8" are wafer style to fit between ANSI B16.5 Class 150 flanges. Disc is contoured for lowest possible pressure drop (highest Cv). Shaft is 410 S.S. and of one piece, through shaft design, with square drive through entire length of blade. 2" - 6" valves shall be complete with a spring loaded 6 position latch lever. 8" valves shall be either spring lever or gear actuated as required or specified. Seat liners shall be full faced with integral, ribbed flanges. No auxiliary gaskets shall be required for installation. Seat liners shall effectively isolate the body and shaft from the flow media. Seat liners shall also thermally insulate the body from the internal operating temperature. Valve liner and seals are replaceable. Materials of construction shall be: (select as required for service)

Note: The universal style 2-4" butterfly valve fits between ANSI B16.5, DIN, and JIS class 150 flanges, the 6" between ANSI and JIS flanges and the 8" between ANSI flanges.

BODY

PVC, ASTM D-1784, (Standard) PP and PVDF available
PP, ASTM D-4101 PVDF available
PVDF, ASTM D-3222

DISC

PP, ASTM D-4101 (Standard) PVDF available
PVDF, ASTM D-3222

SHAFT

ASTM A-240, TYPE 410 S.S. (Standard) 304 S.S., 316 S.S. available

SEALS / SEAT

EPDM, Ethylene Propylene Diene Monomer
Fluorocarbon, Viton® (Dupont Dow Elastomers)
Fluorel (3M Corp.)

HARDWARE

2" - 8" 304 S.S.

LEVER

ABS, ASTM D-1788

GEAR BOX

Cast iron housing ASTM A -53, Epoxy coated

OTHER MATERIALS AVAILABLE UPON REQUEST.

Not recommended for compressed air or gas service



THERMOPLASTIC VALVES INC.

**ARRANGEMENT DRAWING
COMPACT BALL VALVE**

SIZE: 1/2" - 4"

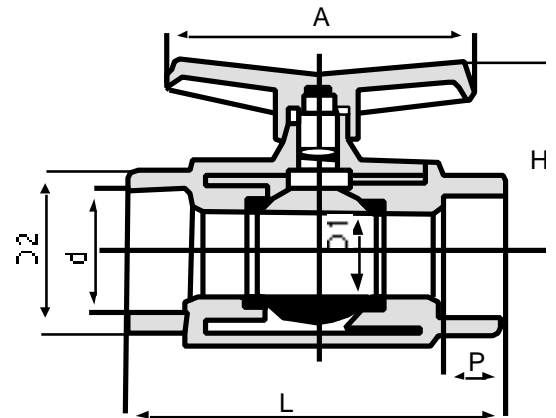
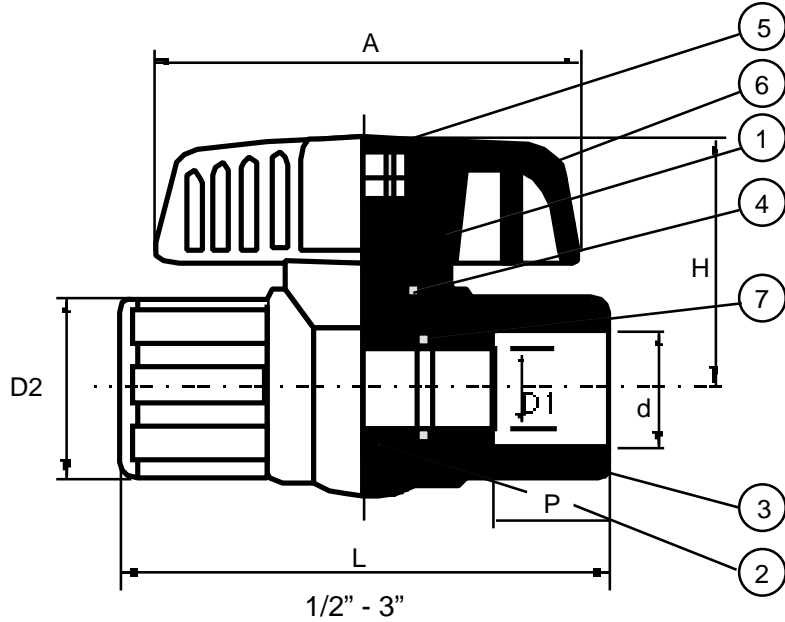
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4" only

Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials
1	Stem	1	PVC, CPVC	5	Cap	1	ABS
2	Ball	1	PVC, CPVC	6	Handle	1	ABS
3	Body	1	PVC, CPVC	7	Seat	2	EPDM, TEFLON®, VITON®
4	Stem O-Ring	1	EPDM, VITON®	TEFLON® is a trademark of Dupont Dow Elastomers			

Ansi Dimensions

Size Inch	D1	Socket	d	Thread	P	L	D2	H	A	Body Test Press PSI
1/2"	0.591	0.840		NPT 1/2"	0.875	3.110	1.378	1.820	2.756	222
3/4"	0.787	1.050		NPT 3/4"	1.000	3.543	1.575	2.244	3.031	222
1"	0.984	1.315		NPT 1"	1.125	4.134	1.890	2.402	3.504	222
1 1/4"	1.260	1.660		NPT 1 1/4"	1.250	4.764	2.126	2.598	3.504	222
1 1/2"	1.535	1.900		NPT 1 1/2"	1.375	5.000	2.441	2.913	4.370	222
2"	1.969	2.375		NPT 2"	1.500	5.866	2.953	3.150	5.472	222
2 1/2"	1.969	2.875		NPT 2 1/2"	1.750	7.638	3.622	4.213	6.378	222
3"	2.559	3.500		NPT 3"	1.875	9.173	4.409	5.512	7.480	148
4"	3.071	4.500		NPT 4"	2.250	9.606	5.236	6.575	9.055	148

Testing performed on PVC materials at 73°F water temperature, non-shock.

TVI COMPACT BALL VALVES (1/2" - 4")

DESIGN SPECIFICATIONS

Thermoplastic ball valves 1/2" - 4" shall be compact type and have a one piece molded body with socket or threaded end connections. Seats shall be EPDM. Every valve is fully pressure and cycle tested to insure a quality molded in place finished product. Valves have a one piece self centering ball and stem design for leak tight operation. Materials of construction shall be as follows: (select as required for service)

BODY

PVC, CPVC, ASTM D-1784

BALL & STEM

PVC, CPVC, ASTM D-1784

SEATS

EPDM, Ethylene Propylene Diene Monomer
Fluorocarbon - VITON ® (Dupont Dow Elastomers)
Teflon ® (Dupont Dow Elastomers)

SEALS

EPDM, Ethylene propylene Diene Monomer
Fluorocarbon - VITON ® (Dupont Dow Elastomers)

T-HANDLE

ABS D-1788

End connectors shall conform to the following standards:

SOCKET

ASTM - D-2467 (PVC, SCH-80)
ASTM - F-439 (CPVC, SCH-80)

THREADED

ASTM - D-2464 (PCP, SCH-80)
ASTM - F-439 (CPVC, SCH-80)

Not recommended for compressed air or gas service.



THERMOPLASTIC VALVES INC.

**ARRANGEMENT DRAWING
TRUE UNION DIAPHRAGM VALVE**

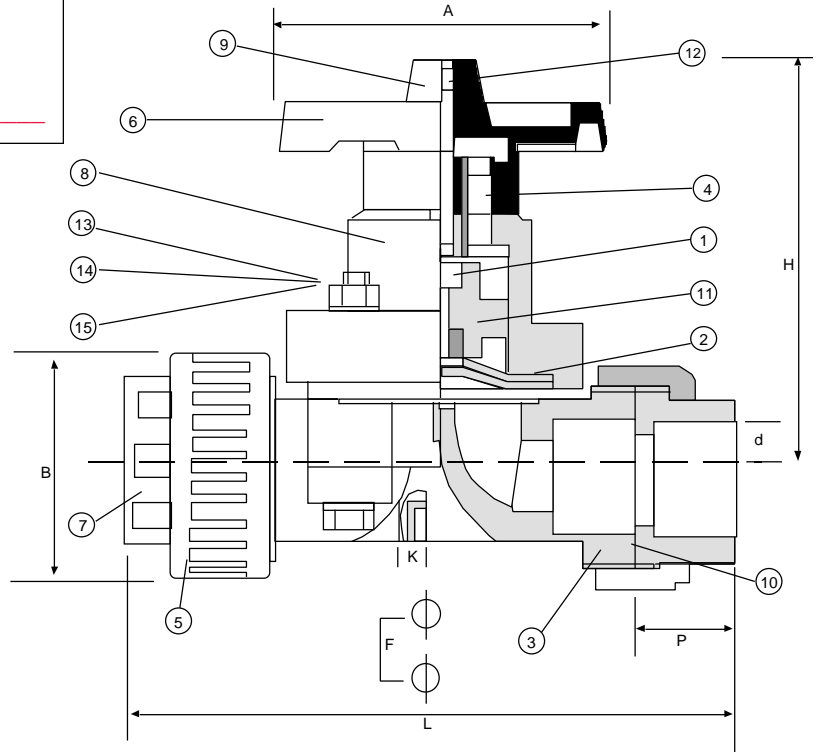
SIZE: 1/2" - 2"

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DIMENSIONS**

Date _____ Per: _____



Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials
1	Shaft	1	Brass/PVDF	9	Gauge Cover	1	PC
2	Diaphragm	1	EPDM,TEFLON®	10	O-Ring	2	EPDM,VITON®
3	Body	1	PVC,PP,CPVC,PVDF	11	Compressor	1	PVDF/Brass/PPO
4	Sleeve	1	Brass/PVDF	12	Indicator	1	PE
5	Union Nut	2	PVC,PP,CPVC,PVDF	13	Bolt	4	SUS304
6	Handle	1	ABS/PPO	14	Nut	4	SUS304
7	End Connector	2	PVC,PP,CPVC,PVDF	15	Washer	4	SUS304
8	Bonnet	1	PPO				

TEFLON® & VITON® are trademarks of Dupont Dow Elastomers

Note: For valves to be used in sodium hypochlorite, factory must be consulted for alternate gasket material.

Ansi Dimensions

Size Inch	d		P	B	L	H	A	F	K	Test Pressures in PSI	
	Socket	Thread								TFE Diaphragm	Rubber Diaphragm
1/2"	0.840	NPT1/2"	0.875	2.126	6.457	4.094	3.189	0.984	M6	104	150
3/4"	1.050	NPT3/4"	1.000	2.126	6.457	4.094	3.189	0.984	M6	104	150
1"	1.315	NPT1"	1.125	2.480	7.087	4.567	3.583	0.984	M6	104	150
1 1/4"	1.660	NPT1 1/4"	1.250	3.346	9.252	5.591	4.606	1.772	M8	104	150
1 1/2"	1.900	NPT1 1/2"	1.375	3.346	9.252	5.591	4.606	1.772	M8	104	150
2"	2.375	NPT2"	1.500	3.898	10.472	6.929	5.906	1.772	M8	104	150

Testing performed with PVC materials at 73°F water temperature, non-shock.

1/2" - 2" DIAPHRAGM VALVES TRUE UNION TYPE (SOC./THD./FLANGED)

DESIGN SPECIFICATION

Thermoplastic Diaphragm Valves 1/2" - 2" (valves shall be molded of solid thermoplastic materials.) Body is of the weir configuration exhibiting large flow area and good flow control capability. Stem and sleeve shall be brass. Full stroke position indication is enclosed in a clear protective cover. All external fasteners shall be either encapsulated in plastic or of stainless steel materials. Materials of construction shall be: (select as required for service)

BODY

PVC, CPVC,ASTM D-1784,PP,ASTM D-4101,PVDF, ASTM D-3222

BONNET

PVC,CPVC,ASTM D-1784,PP,ASTM D-4101,PVDF, ASTM D-3222
PPO,ASTM D-4101 (Standard)

STEM/SLEEVE

Brass

COMPRESSOR

PVDF, ASTM, D-3222
PPO, ASTM, D-4101

DIAPHRAGM

EPDM, Ethylene Propylene Diene Monomer
PTFE/EPDM, Teflon (Dupont Dow Elastomers)

DIAPHRAGM INSERT STUD

Stainless Steel, Large Diameter

POSITIVE INDICATOR COVER

PC, Polycarbonate, ASTM - D-2848

HANDWHEEL

ABS, ASTM D-1788

NOTE: For any diaphragm application with use of sodium hypochlorite, factory must be informed prior to quote. Special application valves are required.



HERMOPLASTIC VALVES INC.

ARRANGEMENT DRAWING DIAPHRAGM VALVE-FLG.TYPE

SIZE: 1/2" - 10"

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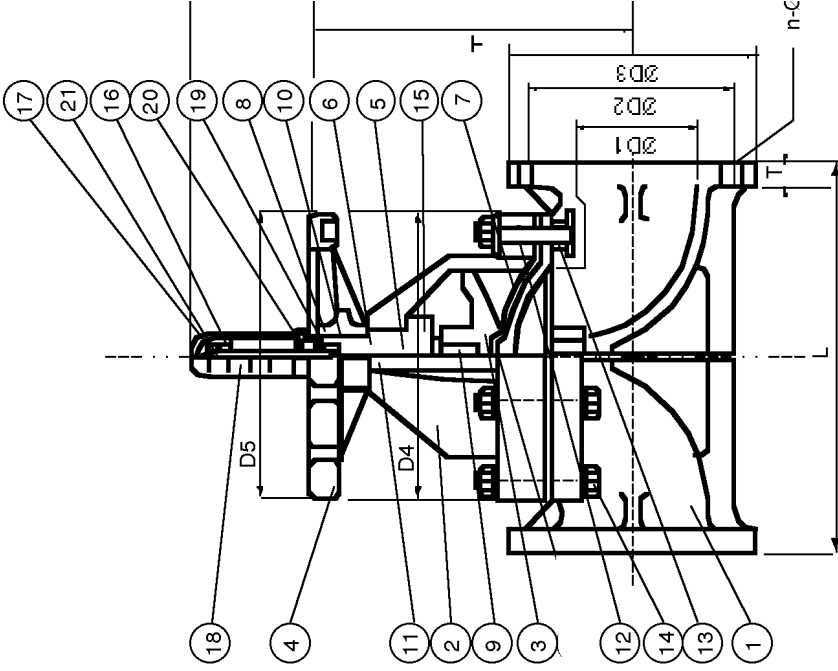
Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials
1	Body	1	PVC PP/PVDF/CPVC	11	Grease Nipple	1	BRASS
2	Bonnet	1	PVC/PP PVDF/CPVC/PPO	12	Stud Bolt & Nut	1/2"-1" 1/2"-2"	4 Sets 6 Sets SS41, SUS304
3	Compressor	1	1/2"-1" PP-GH/nylon 1 1/4"-1 1/2" CAST IRON*	13	Inserted Nut	1/2"-3"	9 Sets 16 Sets BRASS
4	Hand Wheel	1	PP	14	Bolt Nut & Washer	1/2"-10"	8 Sets 20 Sets SS41, SUS304
5	Sleeve	1	1/2"-2" BRASS 2 1/4"-10" CAST IRON*	15	Thrust Bearing	1	Standard 3" - 10" Used Only
6	Stem	1	1/2"-2" BRASS 2 1/4"-10" SS-41	16	Stopper	1	SS-41, BRASS, SUS304
7	Diaphragm	1	EPDM/HYPALON® TEFLON®	17	Set Nut	1	SS-41, BRASS, SUS304
8	Cap	1	1/2"-2" BRASS 2 1/4"-10" PVC, PP*	18	Gauge Cover	1	POLYCARBONATE
9	Compressor Pin	1	SUS-304	19	Sheet Gasket	1	EPDM
10	Name Plate	1	PVC	20	Sheet Ring	1	SS-41, BRASS, SUS304
HYPALON® VITON® and TEFLON® are trademarks of DuPont Dow Elastomers							
				21	Spring Washer	1	SS-41, SUS304

Ansi Dimensions

Size Inch	D1	D2	D3	e	D4	D5	Lift	L	T	H	Rubber Diaphragm @ 73°F				Teflon Diaphragm @ 73°F				
											UPVC	PP	PPG	CPVC	PVDF	UPVC	PP	PPG	CPVC
1/2	0.63	2.38	3.50	0.63	4	2.32x2.09	3.70	0.51	0.51	3.98	5.51	150	150	150	150	105	105	105	105
3/4	0.79	2.76	3.86	0.63	4	2.80x2.48	3.70	0.51	0.59	4.17	5.98	150	150	150	150	105	105	105	105
1	0.96	3.13	4.25	0.63	4	3.15x2.60	3.70	0.55	0.67	4.45	6.22	150	150	150	150	105	105	105	105
1 1/2	1.61	3.88	5.00	0.63	4	4.96	5.79	0.94	0.67	5.24	7.60	150	150	150	150	105	105	105	105
2	2.05	4.74	5.96	0.75	4	5.83	5.79	1.10	0.67	5.71	8.27	150	150	150	150	105	105	105	105
2 1/2	2.68	5.49	7.01	0.75	4	7.48	7.95	1.26	0.79	7.76	10.67	150	150	150	150	105	105	105	105
3	3.07	6.00	7.82	0.75	4	8.46	7.95	1.34	0.79	8.50	11.54	150	150	150	150	105	105	105	105
4	3.94	7.50	9.02	0.75	8	10.04	9.49	2.13	1.10	10.28	14.57	150	150	150	150	90	75	90	90
5	4.92	8.50	10.00	0.87	8	12.60	10.79	2.83	1.10	12.13	16.22	105	105	105	105	60	60	60	60
6	5.83	9.51	10.96	0.87	8	15.16	15.55	2.83	1.26	13.15	18.54	105	105	105	105	60	60	60	60
8	7.80	11.75	13.50	0.87	8	16.93	15.55	2.44	1.26	16.40	24.61	60	60	60	60	45	45	45	45
10	9.76	14.25	15.98	0.98	12	21.26	21.85	5.20	1.34	20.08	29.53	60	45	60	60	45	45	45	45

Testing performed on PVC body, EPDM diaphragm at 73°F water temperature, non-shock



FLANGED BODY TYPE 1/2" - 10" DIAPHRAGM VALVES

DESIGN SPECIFICATION

Thermoplastic Diaphragm Valves 1/2" - 10" shall be molded of solid thermoplastic materials for body and bonnet. Body is of the weir configuration exhibiting large flow area and good flow control capability. Body is designed to fit between ANSI B16.5 class 150 flanges. Stem and sleeve shall be brass or cast iron, fully lubricated. Sizes 3" and larger employ a bonnet grease fitting for ease of lubrication. All valves shall have an adjustable overtravel stop in the close position to prevent overtravel and premature diaphragm failure. Full stroke position indication is enclosed in a clear protective cover. All external fasteners shall be either encapsulated in plastic or of stainless steel materials. Materials of construction shall be: (select as required for service)

BODY

PVC, CPVC,ASTM D-1784,PP,ASTM D-4101,PVDF, ASTM D-3222

BONNET

PVC,CPVC,ASTM D-1784,PP,ASTM D-4101,PVDF, ASTM D-3222
PPO, ASTM D-4101 (Standard)

STEM/SLEEVE

Brass, 1/2" - 2",
C.I., 2 1/2" - 10"

DIAPHRAGM

EPDM, Ethylene Propylene Diene Monomer
Fluorocarbon, Viton (Dupont Dow Elastomers) only avail. for vacuum service.
PTFE/Neoprene, Teflon (Dupont Dow Elastomers)

DIAPHRAGM INSERT STUD

Stainless Steel, Large Diameter

POSITIVE INDICATOR COVER

PC, Polycarbonate, ASTM - D-2848

HANDWHEEL

ABS, ASTM D-1788

NOTE: For any diaphragm application with use of sodium hypochlorite, factory must be informed prior to quote.

TVI THERMOPLASTIC VALVES INC.

ARRANGEMENT DRAWING HORIZONTAL SWING CHECK VALVE

SIZE: 3/4" - 8"

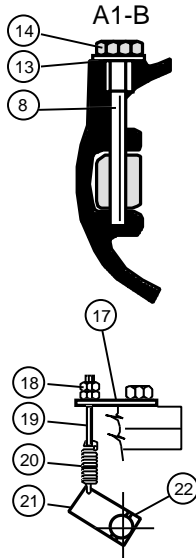
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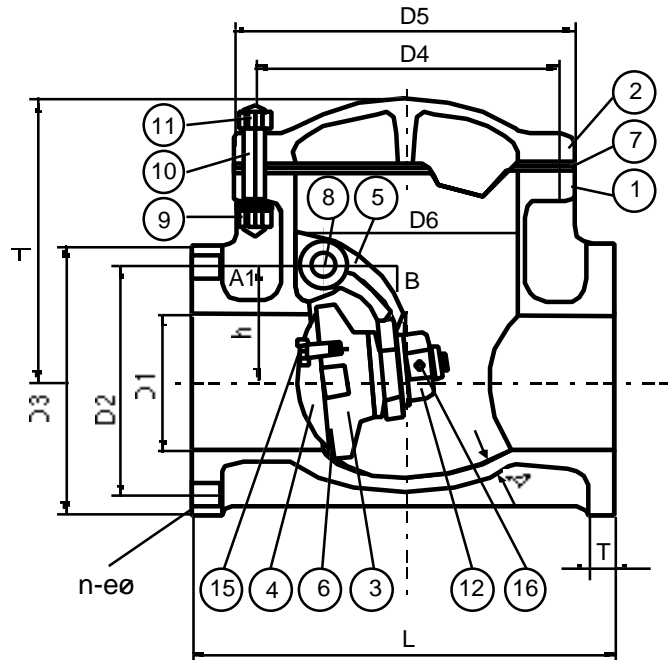
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Adjustable
Spring
Assist
Option



Materials of Construction

Item	Parts	Pcs	Materials
1	Body	1	PVC,PP,PPG,PVDF
2	Bonnet	1	PVC,PP,PPG,PVDF
3	Disc	1	PVC,PP,PPG,PVDF
4	Sheet Gasket Holder	1	PVC,PP,PPG,PVDF
5	Swing Arm	1	PVC,PP,PPG,PVDF
6	Disc Gasket	1	EPDM,VITON®TFE
7	Bonnet Gasket	1	EPDM,VITON®
8	Shaft	1	PVC,PP,PPG,PVDF
9	Washer	1"- 3"	6 sets SUS304
10	Bolts	4"- 8"	8 sets SUS304
11	Nuts		SUS304

Item	Parts	Pcs	Materials	
12	Disc Holder	1	PVC,PP,PPG,PVDF	
13	O-ring	1	EPDM,VITON®	
14	Shaft Holder	1	PVC,PP,PPG,PVDF	
15	Set Bolts	1 1/2"- 2" 5"- 6"	1 4 2 1/2"- 4" 3 8	PVC, PP PPG, PVDF
16	Set Pin	1	PVC, PP, PPG, PVDF	
17	Bracket	1	316 Stainless Steel	
18	Nut	1	316 Stainless Steel	
19	Adjustment Stem	1	316 Stainless Steel	
20	Spring	1	316 Stainless Steel	
21	Lever	1	PVC	
22	Pin	1	316 Stainless Steel	

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Ansi Dimensions

Size Inch	D1	D2	D3	e	n No. of holes	D4	D5	D6	L	T	A	h	H	Working Pressure Elastomer TFE	
														psi	bar
3/4"	1.00	2.75	4.25	0.63	4	4.34	5.13	2.97	6.31	0.50	0.25	1.56	4.72	150	50
1"	1.00	3.13	4.25	0.63	4	4.34	5.13	2.97	6.31	0.59	0.25	1.56	4.72	150	50
1 1/2"	1.63	3.88	5.00	0.63	4	4.94	5.72	3.34	7.09	0.63	0.31	1.78	5.44	150	50
2"	2.06	4.75	6.00	0.75	4	6.09	7.09	4.13	7.88	0.83	0.31	2.16	6.46	150	50
2 1/2"	3.16	5.50	7.00	0.75	4	7.13	8.06	5.13	10.25	0.83	0.34	2.75	6.72	150	50
3"	3.16	6.00	7.50	0.75	4	7.13	8.06	5.13	10.25	0.83	0.34	2.75	6.72	150	40
4"	3.94	7.50	9.00	0.75	8	9.25	10.44	6.69	11.93	0.87	0.41	3.53	8.38	100	40
5"	4.94	8.50	10.00	0.88	8	11.22	13.00	8.28	13.78	0.87	0.56	4.34	9.38	100	25
6"	5.53	9.50	11.00	0.88	8	13.00	14.56	9.84	15.75	0.91	0.63	5.31	10.56	100	20
8"	7.88	11.75	13.50	0.88	8	15.31	16.71	11.81	19.69	1.02	0.72	6.69	12.06	70	20

Testing performed on PVC material at 73°F water temperature, non-shock.

TVI SWING CHECK VALVES (3/4" - 8" FLANGED)

DESIGN SPECIFICATIONS

Thermoplastic Swing Check Valves 3/4" - 8" flanged design shall employ molded thermoplastic body, disc assembly, bonnet, and shaft. Metal internals are not acceptable. Valves have a full faced disc seal. Valves require low back pressure for drop-tight seating. Valves are of low pressure drop design. Body has a full open disc stop to prevent over travel and insure proper closing action. Bonnet is fully gasketed and fastened using stainless steel hardware. Valves are top entry design for ease of maintenance. Valves are suitable for vertical and horizontal installation. Flanged ends are designed for installation between ANSI B16.5 Class 150 flanges. Materials of construction shall be as follows: (select as required for service)

BODY/BONNET

PVC, ASTM D-1784
PP, ASTM D-4101
PVDF, ASTM D-3222

DISC ASSEMBLY / SHAFT

PVC, ASTM D-1784
PP, ASTM D-4101
PVDF, ASTM D-3222

SEAT / SEAL

EPDM, Ethylene propylene diene monomer
Fluorocarbon, Viton® (Dupont Dow Elastomers)
Fluorel (3M Corp.)
PTFE (Polytetrafluoroethylene), Teflon® (Dupont Dow Elastomers)

EXTERNAL FASTNERS

304 Stainless Steel

NOTE: Can be easily modified for spring assist operation. See details on Pg. 58.

TVI THERMOPLASTIC VALVES INC.

ARRANGEMENT DRAWING BALL VALVE SAFETY BLOCK TRUE UNION

SIZE: 1/2" - 3"

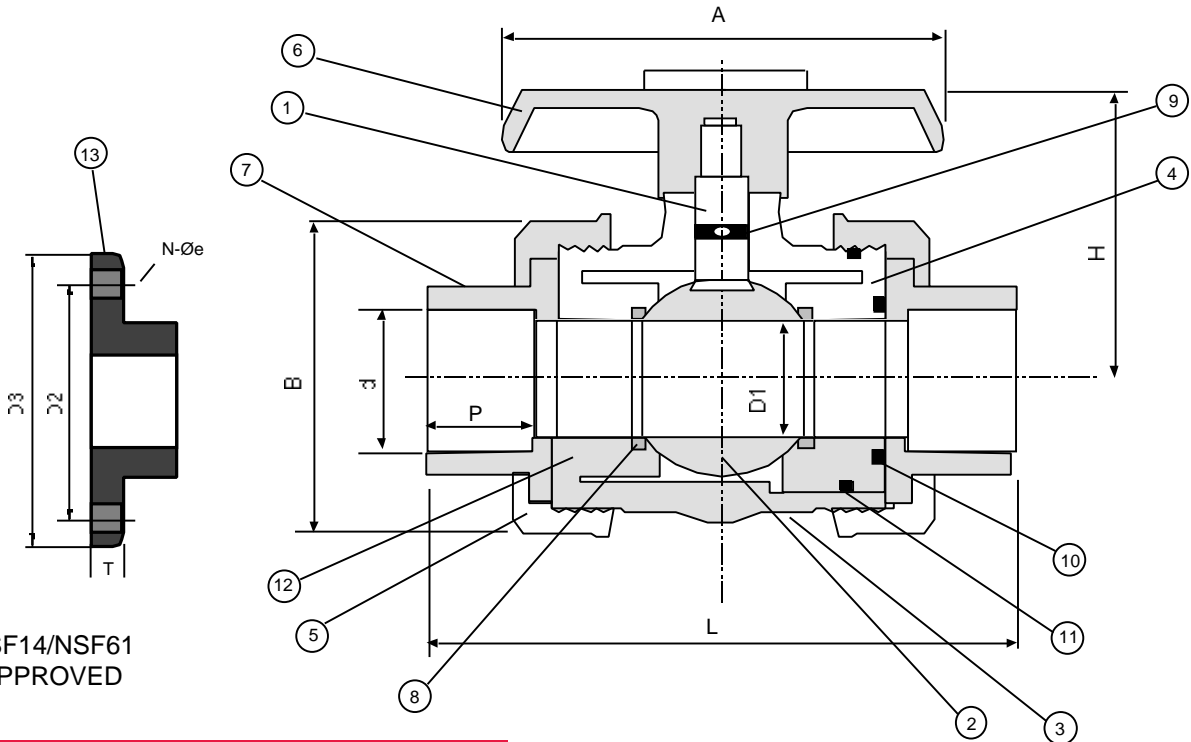
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Materials of Construction

Item	Parts	Pcs	Materials
1	Stem	1	PVC, PP, CPVC, PVDF
2	Ball	1	PVC, PP, CPVC, PVDF
3	Body	1	PVC, PP, CPVC, PVDF
4	Seat Carrier	1	PVC, PP, CPVC, PVDF
5	Union Nut	2	PVC, PP, CPVC, PVDF
6	Handle	1	ABS
7	End Connector	2	PVC, PP, CPVC, PVDF

Item	Parts	Pcs	Materials
8	Seat	2	TEFLON®
9	Stem O-Ring	1	EPDM, VITON®
10	Seat Carrier O-Ring	1	EPDM, VITON®
11	Body O-Ring	1	EPDM, VITON®
12	Solid End O-Ring	1	EPDM, VITON®
13	Flange	2	PVC, PP, CPVC, PVDF

VITON® and TEFLON® are trademarks of Dupont Dow Elastomers

Ansi Dimensions

Size Inch	d								L			Working Pressure (PSI)				
	D ₁	D ₂	D ₃	Socket	Thread	e	n	P	Socket	Thread	Flange	A	T	H	B	
1/2"	.591	2.375	3.500	0.840	NPT 1/2"	0.625	4	0.875	4.049	4.049	5.640	3.240	.590	2.028	2.114	150
3/4"	.799	2.750	3.875	1.050	NPT 3/4"	0.625	4	1.000	4.843	4.843	6.670	3.976	.590	2.638	2.500	150
1"	1.024	3.125	4.250	1.315	NPT 1"	0.625	4	1.125	5.689	5.689	7.090	4.390	.630	2.697	2.874	150
1 1/4"	1.20	3.500	4.625	1.660	NPT 1 1/4"	0.625	4	1.250	6.520	6.520	8.510	4.340	.630	2.768	3.228	150
1 1/2"	1.50	3.875	5.000	1.900	NPT 1 1/2"	0.625	4	1.375	7.160	7.160	9.280	4.780	.630	3.340	3.850	150
2"	1.89	4.750	6.000	2.375	NPT 2"	0.750	4	1.500	7.950	7.950	10.150	5.880	.787	3.850	4.733	150
2 1/2"	2.64	5.500	7.000	2.889	NPT 2 1/2"	0.750	4	1.750	8.860	8.860	11.540	7.480	.787	5.51	5.91	150
3"	3.15	6.000	7.500	3.516	NPT 3"	0.750	4	1.875	10.830	10.830	14.920	9.050	.866	6.54	7.20	150

Testing performed on PVC/EPDM valves at 73°F water temperature, non-shock.

TVI SAFETY BLOCK - TRUE UNION BALL VALVES

DESIGN SPECIFICATIONS

Thermoplastic Ball Valves 1/2" - 4" are designed to safely block full system pressure in either direction to allow on-line system maintenance. Valve stem is of the blow-out proof design. Valve has full port for lowest possible pressure loss. Seats shall be easily adjustable and replaceable. Stem has an internal pressure sealed land to protect stem and stem seal from contaminants. Every valve is fully pressure and cycle tested before leaving the factory. Materials of construction shall be: (select as required for service)

BODY/BALL/STEM/END NUTS AND CONNECTORS

PVC, CPVC, ASTM D-1784

PP, ASTM D-4101

PVDF, ASTM D-3222

SEAT

PTFE (Polytetrafluoroethylene), Teflon® (DuPont Dow Elastomers)

SEALS

EPDM, Ethylene Propylene Diene Monomer

Fluorocarbon. Viton® (DuPont Dow Elastomers)

Fluorel (3M Corp.)

MANUAL LEVER

ABS, ASTM D-1788

End connectors shall conform to the following standards:

SOCKET

ASTM - D-2467 (PVC, SCH-80)

ASTM - F-439 (CPVC, SCH-80)

THREADED

ASTM - D-2464 (PVC, SCH-80)

ASTM - F-437 (CPVC, SCH-80)

FLANGED -

ANSI - B16.5 Class 150

Both socket and threaded end connectors shall be supplied on all 1/2" - 2" PVC and CPVC valves. On 2 1/2" - 4" socket end connectors will be supplied unless otherwise specified.

Valves shall be backed by a full two (2) year guarantee.

Not recommended for compressed air or gas service.



THERMOPLASTIC VALVES INC.

STANDARD 4" SAFTEY BLOCK BALL VALVE

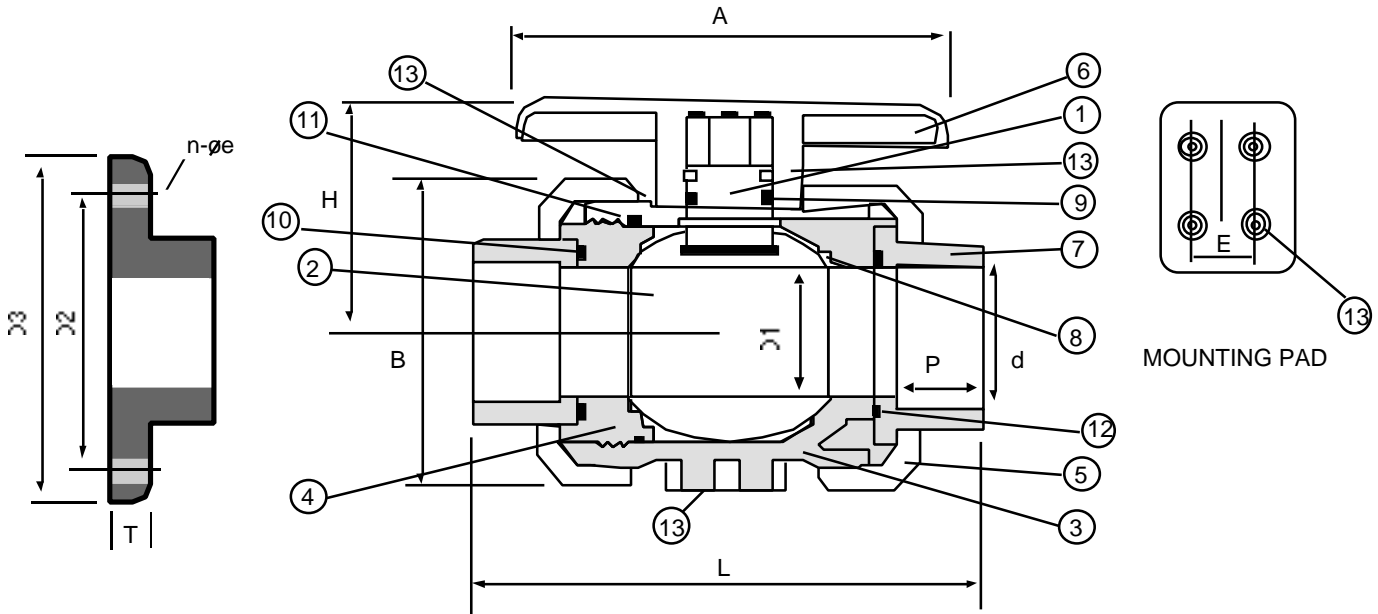
SIZE: 4"

**DWN BY
CKP**

**DATE
1-96**

**DWG NO.
103-SB**

**CERTIFIED
CORRECT FOR GENERAL DIMENSIONS** Date _____ Per: _____



Materials of Construction

Item	Parts	Pcs	Materials	ItemParts	Pcs	Materials
1	Stem	1	PVC,PP,CPVC,PVDF	8	2	PTFE
2	Ball	1	PVC,PP,CPVC,PVDF	9	1	EPDM,VITON®
3	Body	1	PVC,PP,CPVC,PVDF	10	1	EPDM,VITON®
4	Seat Carrier	1	PVC,PP,CPVC,PVDF	11	1	EPDM,VITON®
5	Union Nut	2	PVC,PP,CPVC,PVDF	12	1	EPDM,VITON®
6	Handle	1	ABS	13	4	Brass
7	End Connector	2	PVC,PP,CPVC,PVDF			

VITON® is a trademark of Dupont Dow Elastomers.

Ansi Dimensions

Size Inch	D1	D2	D3	d Socket	Thread	P	e	n	Socket	L Thread	Flange	A	T	H	B	E	working pressure (psi)
4"	4.02	5.500	7.000	4.518	NPT4"	2.250	0.750	8	12.80	12.80	15.18	10.79	0.866	6.69	8.90	1.93	150

4" valve available venturied to 6" size

Testing performed with PVC/EPDM valves at 73°F water temperature

TVI THERMOPLASTIC VALVES INC.

SAFETY BLOCK TRUE UNION BALL VALVE WITH MOUNTING PADS

SIZE: 1/2" - 3"

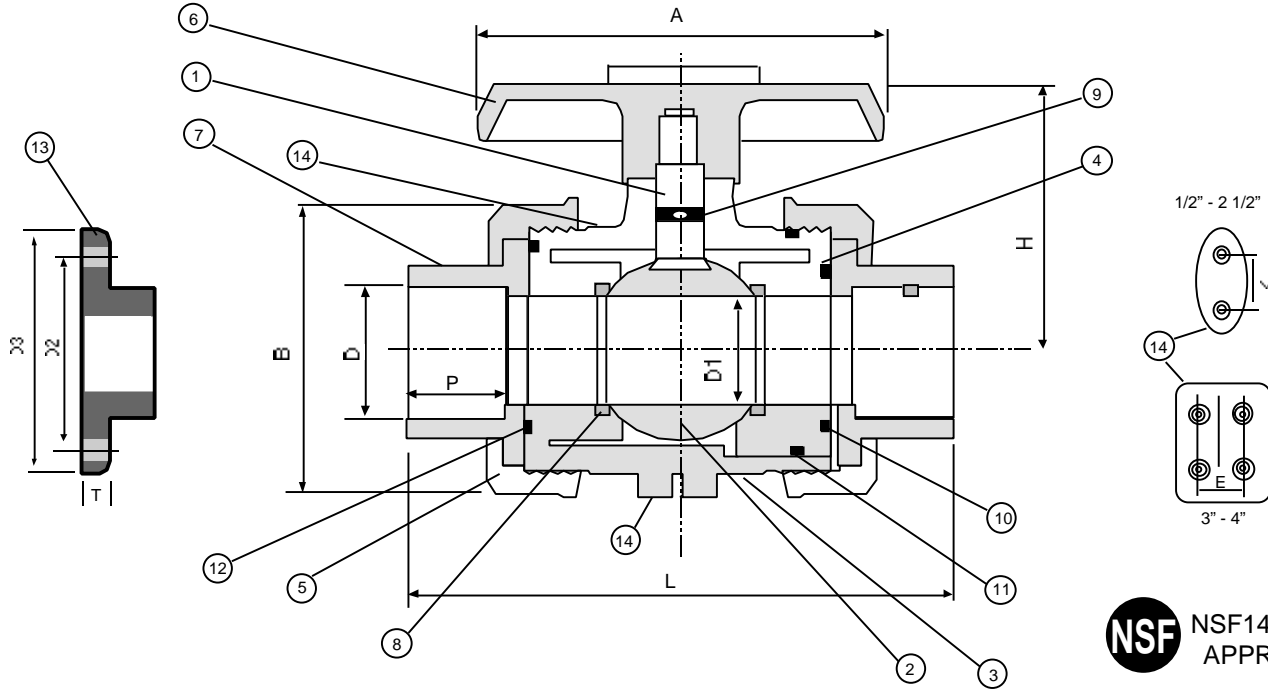
DWN BY
CKP

DATE
1-96

DWG NO.
103-SB(A)

CERTIFIED

CORRECT FOR GENERAL DIMENSIONS Date _____ Per: _____



Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials
1	Stern	1	PVC, PP, CPVC, PVDF	8	Seat	2	TEFLON®
2	Ball	1	PVC, PP, CPVC, PVDF	9	Stem O-rings	1	EPDM, VITON®
3	Body	1	PVC, PP, CPVC, PVDF	10	Seat Carrier O-ring	2	EPDM, VITON®
4	Seat Carrier	1	PVC, PP, CPVC, PVDF	11	Body End O-ring	1	EPDM, VITON®
5	Union Nut	2	PVC, PP, CPVC, PVDF	12	Solid End O-ring	2	EPDM, VITON®
6	Handle	1	UPVC, PP, PVDF, CPVC	13	Flange	2	PVC, PP, CPVC, PVDF
7	End Connector	2	PVC, PP, CPVC, PVDF	14	Mounting Pad		w/Brass Inserts

VITON® and TEFLON® are trademarks of Dupont Dow Elastomers

Ansi Dimensions

Size Inch	d								L			A	T	H	B	Working Pressure (PSI)
	D ₁	D ₂	D ₃	Socket	Thread	e	n	P	Socket	Thread	Flange					
1/2"	.591	2.375	3.500	0.840	NPT 1/2"	0.625	4	0.875	4.420	4.420	6.015	3.240	.590	2.120	2.114	150
3/4"	.799	2.750	3.875	1.050	NPT 3/4"	0.625	4	1.000	4.843	4.843	6.673	3.976	.590	2.530	2.500	150
1"	1.024	3.125	4.250	1.315	NPT 1"	0.625	4	1.125	5.615	5.615	7.765	4.390	.630	2.811	2.874	150
1 1/4"	1.20	3.500	4.625	1.660	NPT 1 1/4"	0.625	4	1.250	7.160	7.160	9.275	4.780	.630	3.340	3.850	150
1 1/2"	1.50	3.875	5.000	1.900	NPT 1 1/2"	0.625	4	1.375	7.160	7.160	9.275	4.780	.630	3.340	3.850	150
2"	1.89	4.750	6.000	2.375	NPT 2"	0.750	4	1.500	7.950	7.950	8.100	5.880	.787	3.850	4.733	150
2 1/2"	2.64	5.500	7.000	2.889	NPT 2 1/2"	0.750	4	1.750	8.860	8.860	11.540	7.480	.787	5.51	5.91	150
3"	3.150	6.000	7.500	3.516	NPT 3"	0.750	4	1.875	10.830	10.830	14.920	9.050	.866	6.54	7.20	150

Testing performed on PVC materials at 73°F water temperature, non-shock.



THERMOPLASTIC VALVES INC.

**TRUEUNION BALL VALVE
BUTT WELDING ENDS**

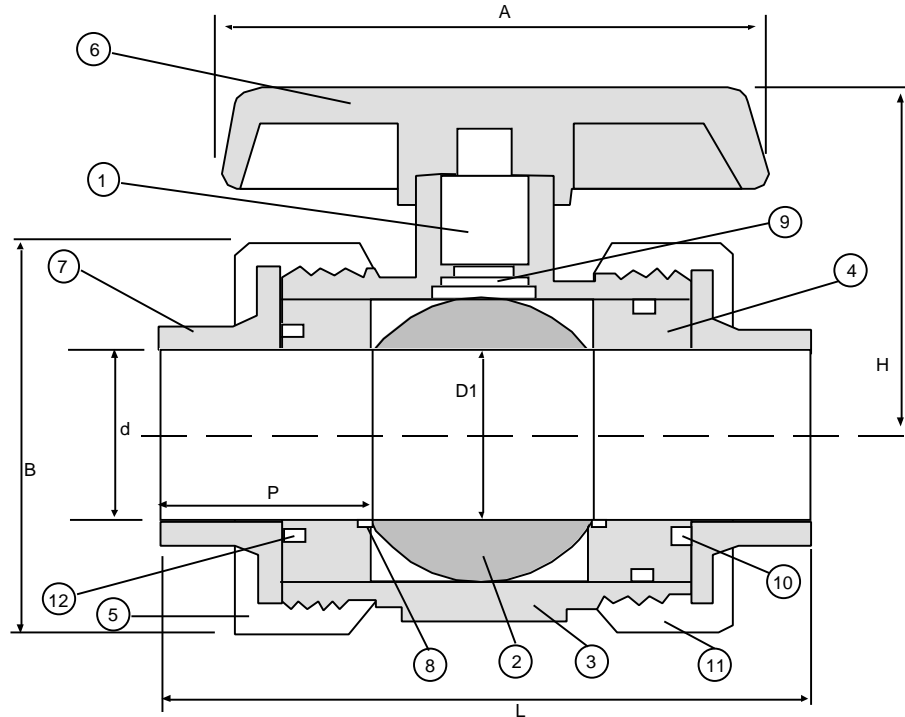
SIZE: 1/2" - 4"

**DWN BY
CKP**

**DATE
04/01**

**DWG NO.
TUBW**

CERTIFIED
CORRECT FOR GENERAL DIMENSIONS Date _____ Per: _____



Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials
1	Stern	1	PP, PVDF	8	Seat	2	PTEF
2	Ball	1	PP, PVDF	9	Stem O-rings	1	EPDM, VITON®
3	Body	1	PP, PVDF	10	Seat Carrier O-ring	1	EPDM, VITON®
4	Seat Carrier	1	PP, PVDF	11	Body End O-ring	1	EPDM, VITON®
5	Union Nut	1	PP, PVDF	12	Solid End O-ring	1	EPDM, VITON®
6	Handle	1	ABS				
7	Connector	2	PP, PVDF				

VITON® and TEFLON® are trademarks of Dupont Dow Elastomers

Ansi Dimensions

Size Inch	D1	d	P	L	A	H	B	Working Pressure (PSI)	Test Pressure (PSI)
1/2"	.59	.59	1.96	6.40	3.23	1.85	1.85	100	150
3/4"	.75	.75	1.96	6.90	3.98	2.52	2.50	100	150
1"	.98	1.02	1.96	7.02	4.37	2.64	2.64	100	150
1 1/4"	1.50	1.25	1.96	7.40	5.04	3.27	3.78	100	150
1 1/2"	1.50	1.60	1.96	7.60	4.96	3.27	3.78	100	150
2"	1.97	2.02	1.96	8.25	5.98	4.02	4.45	100	150
2 1/2"	2.56	2.38	1.96	8.45	7.48	5.51	5.90	70	105
3"	3.07	2.89	3.15	12.13	9.06	6.50	7.25	70	105
4"	3.90	3.55	3.15	17.05	10.79	6.77	7.85	70	105

Testing performed on PP/EPDM valves at 73°F water temperature, non-shock.
Test pressures drop drastically when temperatures exceed 100°F.

TVI TRUE UNION BALL VALVES BUTT WELDING ENDS

DESIGN SPECIFICATIONS

Thermoplastic Ball Valves 1/2" - 4" are designed to safely block full system pressure in either direction to allow on-line system maintenance. Valve stem is of the blow-out proof design. Valve has full port for lowest possible pressure loss. Seats shall be easily adjustable and replaceable. Stem has an internal pressure sealed land to protect stem and stem seal from contaminants. Every valve is fully pressure and cycle tested before leaving the factory. Materials of construction shall be: (select as required for service)

BODY/BALL/STEM/END NUTS AND CONNECTORS

PP, ASTM D-4101
PVDF, ASTM D-3222

SEAT

PTFE (Polytetrafluoroethylene), Teflon® (DuPont Dow Elastomers)

SEALS

EPDM, Ethylene Propylene Diene Monomer
Fluorocarbon. Viton® (DuPont Dow Elastomers)
Fluorel (3M Corp.)

MANUAL LEVER

ABS, ASTM D-1788

Butt welded ends

Valves shall be backed by a full two (2) year guarantee.

Not recommended for compressed air or gas service.



THERMOPLASTIC VALVES INC.

**ARRANGEMENT DRAWING
STRONG UNION BALL VALVE**

SIZE: 6"

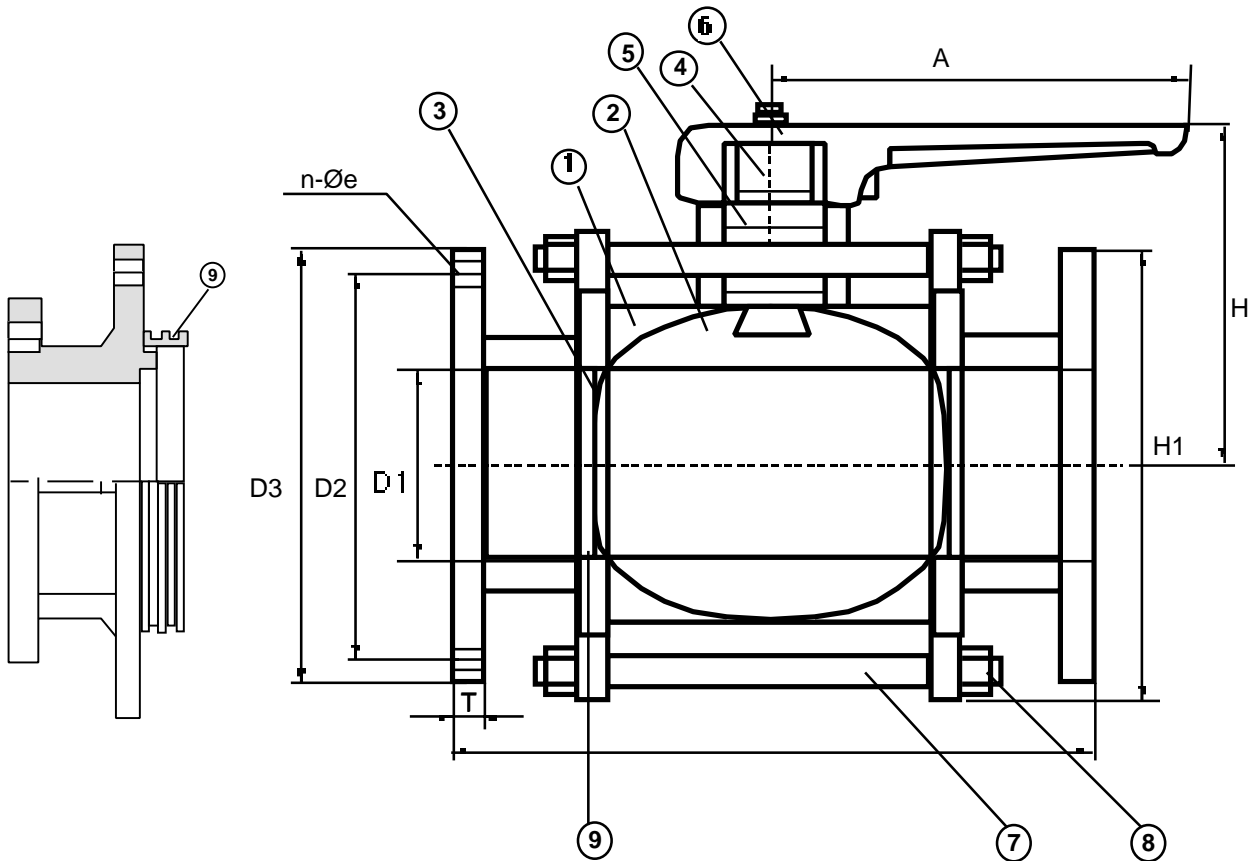
**DWN BY
CKP**

**DATE
1-96**

**DWG NO.
107-SUBV**

CERTIFIED

CORRECT FOR GENERAL DIMENSIONS Date _____ Per: _____



Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials
1	Body	1	PVC,PP,PVDF	5	O-Ring	2	EPDM, VITON®
2	Ball	1	PVC,PP,PVDF	6	Handle	1	CAST IRON,EPOXY COATED
3	Seat	2	TEFLON®	7	Bolt	10 Sets	SUS 304
4	Shaft	1	PVC,PP,PVDF	8	Nut	10 Sets	SUS 304
VITON® and TEFLON® are trademarks of Dupont Dow Elastomers				9	O-Ring	4	EPDM,VITON®

Ansi Dimensions

Size Inch	D ₃	D ₂	D ₁	H	H ₁	L	n	e	T	A	*Test Press (PSI)	Working Press (PSI)
6"	11	9 1/2	5 7/8	8	12 3/8	15 1/2	8	.87	3/4	13	150	125

Testing performed with PVC body at 73°F water temperature, non-shock.
*Test pressure, body hydrostatic.

TVI STRONG UNION BALL VALVE (5-5/8" DIA. PORT)

6" Flanged only

DESIGN SPECIFICATION

Thermoplastic Strong Union Ball Valve 6" flange type is a two piece body design. Full round ball with 5-5/8" I.D. port. Valve stem is of the blow-out proof design. Stem has an internal pressure sealed land to protect stem and stem seal from contaminants. Body parts are connected by 304 S.S. bolting sets. Seats are TFE and easily replaceable.

BODY - BALL - STEM

PVC,ASTM D-1784

PP,ASTM D 4101

PVDF, ASTM D-3222

SEAT

Telfon® (Dupont Dow Elastomers)

SEALS

EPDM, Ethylene Propylene Diene Monomer

Fluorocarbon, Viton® (Dupont Dow Elastomers)

HARDWARE

304 S.S.

LEVER

Cast iron, epoxy coated

Note: Not recommended for compressed air or gas service

**ARRANGEMENT DRAWING
TRUE UNION Y SEDIMENT STRAINER**

SIZE:

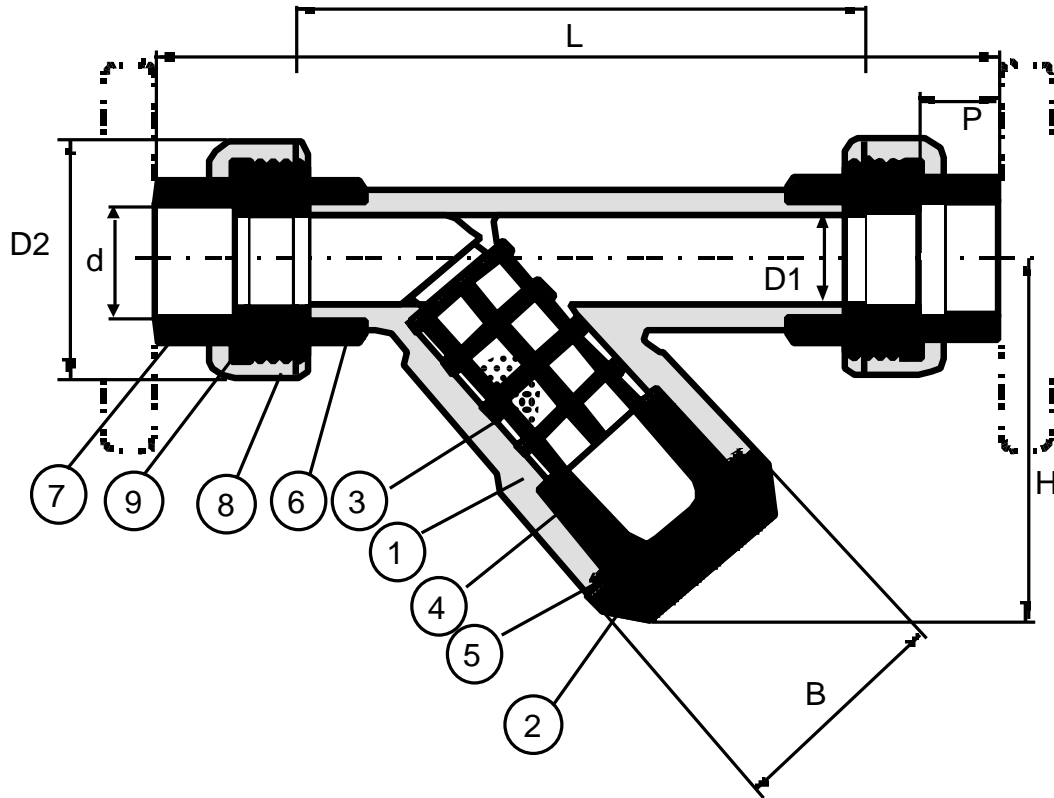
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CKP**

**DATE
1-96**

**DWG NO.
110-YDS**

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CORRECT FOR GENERAL DIMENSIONS Date _____ Per: _____



Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials
1	Body	1	PVC	6	Union End	1	PVC
2	Lid	1	PVC	7	Connector	2	PVC
3	Screen	1	PVC	8	Union Nut	2	PVC
4	Body O-Ring	1	EPDM, VITON®	9	Union O-Ring	2	EPDM, VITON®
5	Cap O-Ring	1	EPDM, VITON®				

VITON® is a trademark of Dupont Dow Elastomers

Ansi Dimensions

Size Inch	D ₁	D ₂	SOC/THD	L FLANGE	P	SOCKET	d THREAD	H	Unit: inch B	Working Pressure (PSI)
1/2"	0.59	1.81	8.0	9.25	0.875	0.840	NPT 1/2"	2.36	1.22	150
3/4"	0.79	2.40	9.5	10.75	1.000	1.050	NPT 3/4"	2.83	1.57	150
1"	1.02	2.64	10.5	12.0	1.125	1.315	NPT 1"	3.43	1.89	150
1 1/4"	1.26	3.35	11.93	13.7	1.250	1.660	NPT 1 1/4"	3.80	2.17	150
1 1/2"	1.57	3.35	12.62	14.4	1.375	1.900	NPT 1 1/2"	4.92	2.76	150
2"	1.97	3.90	14.0	15.75	1.500	2.375	NPT 2"	5.91	2.23	150

Testing performed on PVC/EPDM valves at 73°F water temperature, non-shock.

TVI Y - SEDIMENT STRAINERS 1/2" thru 2"

DESIGN SPECIFICATIONS

Thermoplastic Y - Sediment Strainers have a one piece clear PVC body. The body has true union end connections in either socket or threaded style and flanged if required. Filter screen standard 20 mesh PVC is easily removed for cleaning or replacing. Strainers tested at 150 psi before shipment from manufacturing plant.

BODY

All parts except seals
PVC, ASTM D-1784

SEALS

EPDM, Ethylene Propylene Diene Monomer
Fluorocarbon, Viton® (Dupont Dow Elastomers)

End connectors shall conform to the following standards:

SOCKET

ASTM - D-2467 (PVC, SCH-80)

THREADED

ASTM - D-2464 (PVC, SCH-80)

FLANGED

ANSI - B16.5 Class 150

TVI THERMOPLASTIC VALVES INC.

ARRANGEMENT DRAWING POOL & SPA VALVE

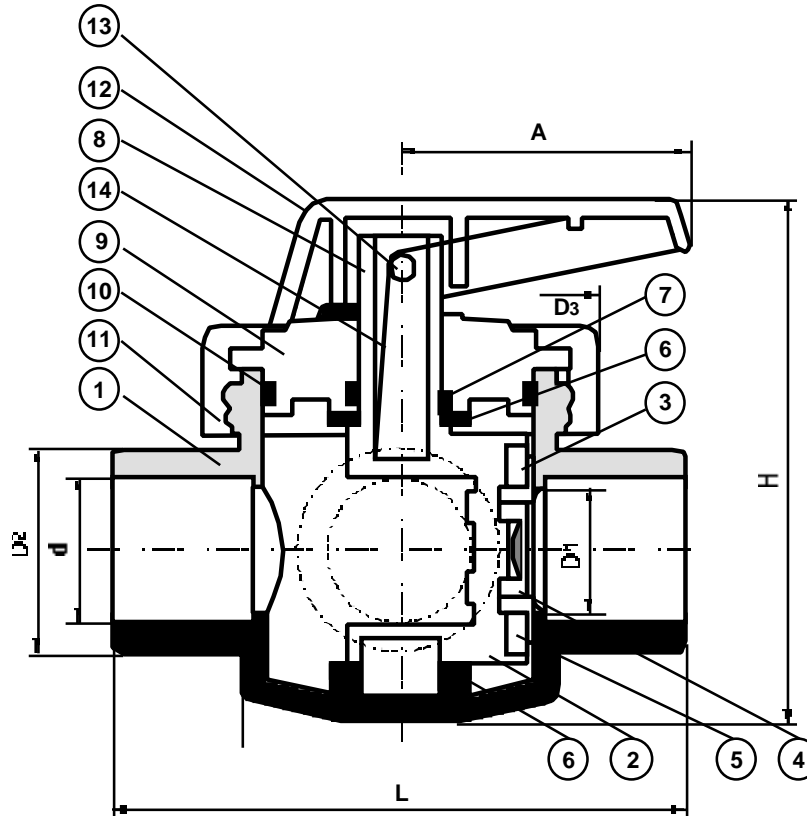
SIZE: 1 1/2" - 2"

DWN BY
CKP

DATE
1-96

DWG NO.
109-PSV

CERTIFIED
CORRECT FOR GENERAL DIMENSIONS Date _____ Per: _____



Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials
1	Body (2 Way or 3 Way)	1	PVC, ABS	8	Rotor Shaft	1	PPG
2	Rotor Gate	1	PPG	9	Lid	1	PVC, ABS
3	Seal Retaining Plate	1	PPG	10	Lid O-Ring	1	EPDM
4	Retaining Plate Screw	2	SUS304	11	Lid Lock Ring	1	ABS
5	Rotor Seal	1	EPDM	12	Handle	1	ABS
6	Bearing	2	ABS	13	Set Pin	1	BRASS
7	Rotor O-Ring	1	EPDM	14	Spring	1	SUS410

Ansi Dimensions

Size Inch	FLOW	d	D1	D2	D3	L	H	Unit: inches A	Working Press PSI	
1 1/2"	2-Way	Socket	Thread	1.57	2.36	4.21	6.46	5.83	3.46	150
	3-Way	Socket	Thread	1.57	2.36	4.21	6.46	5.83	3.46	150
2"	2-Way	Socket	Thread	2.38	2.89	4.92	7.44	6.30	3.46	150
	3-Way	Socket	Thread	2.38	2.89	4.92	7.44	6.30	3.46	150

TVI POOL & SPA VALVE

1 1/2" - 2 WAY AND 3 WAY CONNECTIONS

2" - 2 WAY AND 3 WAY CONNECTIONS

DESIGN SPECIFICATIONS

Thermoplastic Pool & Spa Valves are manufactured for either two way or three way flow direction. Body is one piece. The stem and sealing unit is of the rotary type. The self locking handle makes it easier to use and adjust and the lock ring closure allows quick and easy maintenance without special tools.

BODY

PVC, ASTM D-1784 (white)

ROTOR GATE, SEAL RETAINING PLATE, ROTOR SHAFT

PPG, Polypropylene Glass reinforced

ROTOR SEAL, ROTOR O-RING, LID O-RING

EPDM, Ethylene Propylene Diene Monomer

HANDLE

ABS

End connectors shall conform to the following standards:

SOCKET

ASTM - D2467 (PVC, SCH-80)

THREADED

ASTM - D2464 (PVC, SCH-80)

INDEPENDENT TESTING RESULTS:

2" - 3" Way Valve

10,000 Cycles under 70 psi water pressure at ambient temperature. **Leak Testing:** tests were performed after each 5000 cycles at 70 & 100 psi working pressure at ambient temperature. **No Leakage Occurred!** Valve was not lubricated during the 10,000 cycles. Valve body was tested at 225 psi water pressure for 15 minutes. Results - No leakage, no structural damage.

NOTE : Not recommended for compressed air or gas service

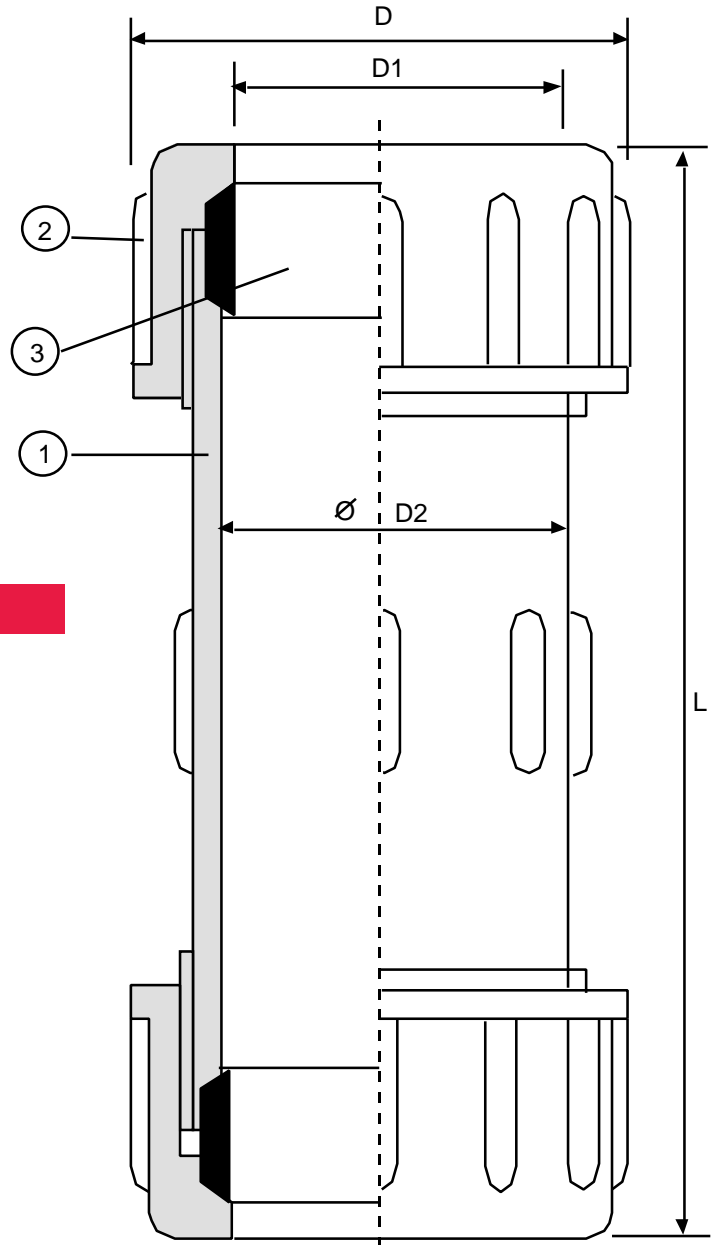
**ARRANGEMENT DRAWING
COMPRESSION COUPLING**

SIZE: 1/2" - 4"

**DWN BY
CKP**

**DATE
11-00**

**DWG NO.
106-CC**



Materials of Construction

Item	Parts	Pcs	Materials
1	Body	1	PVC, (white)
2	Union Nut	2	PVC, (white)
3	Seal	1	Neoprene, EPDM

Ansi Dimensions

SIZES	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
D	1.717	1.929	2.244	2.634	2.882	3.488	4.528	5.118	6.319
D1	.827	1.042	1.307	1.654	1.890	2.366	2.866	3.492	4.492
D2	.878	1.075	1.350	1.693	1.937	2.512	3.012	3.591	4.567
L	4.764	5.039	5.236	5.945	6.614	6.890	9.921	10.906	12.205

COMPRESSION COUPLING 1/2" THRU 4"

DESIGN SPECIFICATIONS

Thermoplastic Compression Couplings have a one piece white PVC body. The body has true union socket end connections. Tested at 150 psi before shipment from manufacturing plant.

BODY

All parts except seals
PVC, ASTM D-1784

SEALS

EPDM, Ethylene Propylene Diene Monomer
Neoprene, EPDM

SOCKET

ASTM-D-2466-78 (PVC, SCH-40)

**CHEMICAL RESISTANCE GUIDE
FOR
THERMOPLASTIC VALVES, PIPE & FITTINGS
ELASTOMERS AND METALS
MAX. TEMP. IN (°F)**

(A) RECOMMENDED, (C) CONDITIONAL, CONSULT WITH CHEMICAL ENGINEERING FIRM.(X)
NOT RECOMMENDED, (BLANK) INFORMATION NOT AVAILABLE.

The information given hereafter is to be used only as a guide. TVI expresses no warranty or liability responsibilities from material selections made from this resistance guide. Temperature, pressure and combined chemicals extreme changes in temperature, extremes in pressure, affect correct material choices.

CHEMICALS & FORMULAS	CONCENTRATION	PVC	CPVC	PP	PVDF	TFE	EPDM	VITON	HYPALON	NEOPRENE	BUNA	BRASS	CARB. STEEL	400 S.S.	316 S.S.	TITANIUM
Acetaldehyde CH ₃ CHO	Conc.	X	X	100 A	X	350 A	200 A	X	70 A	X	X	X	A	C	A	A
Acetic Acid CH ₃ COOH	25%	140 A	73 A	140 A	200 A	350 A	140 A	140 A	200 A	160 A	100 C	X	X	A	A	A
Acetic Acid CH ₃ COOH	60%	73 A	73 A		175 A	350 A	140 A	140 A	200 A	160 A	70 C	X	X	A	A	A
Acetic Acid CH ₃ COOH	85%	73 A	X	120 A	150 A	350 A	140 A	70 A	200 A	160 A	X	X	X	A	A	A
Acetic Anhydride (CH ₃ CO) ₂ O		X	-	-	73 A	350 A	X		200 A	73 C	C	X	X	X	C	C
Acetone CH ₃ COCH ₃	X	X	X	73 A	X	350 A	70 A	X	70 C	X	X	A	A	A	A	A
Aluminum Acetate Al(C ₂ H ₃ O ₂) ₃	Satid.	160 A	175 A	170 A	275 A	350 A	200 A	70 C	X	X	70 C			C	A	A
Aluminum Chloride Aqueous AlCl ₃	Satid.	185 A	185 A	180 A	280 A	250 A	210 A	250 A	200 A	160 A	70 A	X	X	X	A	A
Aluminum Fluoride Anhydrous AlF ₃	Satid.	73 A	185 A	180 A	280 A	250 A	210 A	250 A	200 A	160 A	180 A			X	C	X
Aluminum Sulfate (Alum) Al ₂ (SO ₄) ₃	Satid.	140 A	185 A	180 A	280 A	250 A	210 A	185 A	160 A	140 A	200 A	X	X	X	C	A
Ammonia Gas (Dry) NH ₃	100%	140 A	185 A	150 A	X	400 A	140 A	X	140 A	140 A	140 A	X	A	A	A	A
Ammonia Liquid NH ₃	100%	X	X	73 A	X	400 A	210 A	X	70 A	70 A	70 C	X	A	A	A	A
Ammonium Carbonate (NH ₄)HCO ₃ (NH ₄) ₂ CO ₃	Satid.	140 A	185 A	180 A	280 A	400 A	210 A	250 A	140 A	140 A	140 A	X	A	C	C	C
Ammonium Chloride NH ₄ Cl	Satid.	140 A	185 A	180 A	280 A	400 A	210 A	250 A	200 A	160 A	180 A	X	X	X	C	X
Ammonium Hydroxide NH ₄ OH	10%	140 A	185 A	180 A	225 A	400 A	210 A	70 A	200 A	200 A	70 C	X	X	C	A	A

CHEMICALS & FORMULAS	CONCENTRATION	PVC	CPVC	PP	PVDF	TFE	EPDM	VITON	HYPALON	NEOPRENE	BUNA	BRASS	CARB. STEEL	400 S.S.	316 S.S.	TITANIUM
Ammonium Nitrate NH ₄ NO ₃	Satíd.	140 A	185 A	180 A	280 A	400 A	250 A	300 A	200 A	160 A	180 A	X	X	C	A	A
Ammonium Persulphate (NH ₄) ₂ S ₂ O ₈	Satíd.	140 A	73 A	150 A	73 A	200 A	140 A	70 A	70 A	70 A	70 A	X	X	C	C	A
Ammonium Sulfate (NH ₄) ₂ SO ₄	Satíd.	140 A	185 A	180 A	280 A	400 A	210 A	200 A	140 A	160 A	180 A	X	X	C	C	A
Ammonium Sulfide (NH ₄) ₂ S	Dilute	140 A	140 A	140 A	140 A	350 A	210 A	200 A	200 A	160 A	140 A	X	X	X	C	A
Amyl Acetate CH ₃ COOC ₅ H ₁₁	100%	X	X	X	125 A	100 A	70 C	X	70 A	70 C	X	X	X	A	A	A
Amyl Alcohol C ₅ H ₁₁ OH	100%	140 A	140 A	180 A	280 A	400 A	210 A	185 A			140 C	A	C	A	A	A
n-Amyl Chloride CH ₃ (CH ₂) ₃ CH ₂ Cl	100%	X	X	X	280 A	400 A	X	200 A	X	X	X	A	A	A	A	A
Aniline C ₆ H ₅ NH ₂	100%	X	X	180 A	120 A	200 A	140 A	X	140 A	X	X	X	X	X	C	X
Aniline Hydrochloride C ₆ H ₅ NH ₂ •HCl	Satíd.	X	X		75 A			185 A	200 A	X		X	X	X	X	X
Anthraquinone C ₆ H ₅ (CO) ₂ C ₆ H ₅		140 A						200 A					X	X		
Antimony Trichloride SbCl ₃	Satíd.	140 A		180 A	73 A	200 A	140 A	185 A	140 A	140 A	X	X	X	X	X	X
Arsenic Acid H ₃ AsO ₄ •1/2H ₂ O	80%	140 A	185 A	160 A	280 A	400 A	250 A	200 A	200 A	180 A	160 A	X	X	C	A	C
Asphalt		X	X	X	250 A	350 A	X	180 A	X	X	70 C	A	A	A	A	A
Barium Carbonate BaCO ₃	Satíd.	140 A	160 A	150 A	280 A	400 A	250 A	300 A	200 A	160 A	180 A	A	C	A	A	A
Barium Hydroxide Ba(OH) ₂	Satíd.	140 A	160 A	150 A	280 A	400 A	250 A	300 A	X	140 A	180 A	X	X	A	A	A
Barium Sulfate BaSO ₄	Satíd.	140 A	185 A	150 A	280 A	400 A	250 A	300 A	200 A	160 A	100 A	C	A	A	A	A
Barium Sulfide BaS	Satíd.	140 A	160 A	150 A	280 A	400 A	140 A	300 A	200 A	160 A	X	X	X	A	A	A
Beer		140 A	160 A	180 A	200 A	300 A	200 A	200 A	X	140 A	140 A	A	X	A	A	A
Benzaldehyde C ₆ H ₅ CHO	0.1%	140 A	73 A	73 A	70 A	-	140 A	X	X	X	X	A	X	A	A	A

CHEMICALS & FORMULAS	CONCENTRATION	PVC	CPVC	PP	PVDF	TFE	EPDM	VITON	HYPALON	NEOPRENE	BUNA	BRASS	CARB. STEEL	400 S.S.	316 S.S.	TITANIUM
Benzene C ₆ H ₆		X	X	X	170 A	250 A	X	185 A	X	X	X	A	A	A	A	A
Benzyl Alcohol C ₆ H ₅ CH ₂ OH		X	X	X	250 A			140 C	140 A	140 C	140 A	A	X	A	A	A
Black Liquor	Satíd.	140 A	185 A		175 A	225 A	225 A	200 A	X	X	180 A	X	X	C	A	C
Borax NA ₂ B ₄ O ₇ •10H ₂ O	Satíd.	140 A	160 A	180 A	280 A		210 A	185 A	140 A	140 A	140 A	A	C	A	A	A
Boric Acid H ₃ BO ₃	Satíd.	140 A	185 A	180 A	280 A	300 A	210 A	185 A	140 A	140 A	140 A	C	C	C	A	C
Brine	Satíd.	140 A	180 C	180 A	280 A	400 A	250 A	300 A	180 A	160 A	180 A	X	X	C	A	C
Bromine Water	Cold Satíd.	70 A	X	X	150 A		X	185 A	X	X	X	X	X	X		
Butane C ₄ H ₁₀	50%	140 A		73 A	250 A	350 A	X	185 A	70 A	70 A	70 A	A	A	A	A	A
Butyl Alcohol CH ₃ (CH ₂) ₂ CH ₂ OH		120 A	120 A	180 A	225 A	300 A	200 A	200 A			140 C	X	X	A	A	A
Calcium Bisulfide Ca(HS) ₂ •6H ₂ O		140 A	100 A	140 A	280 A	200 A	A	185 A	A		100	X A	X	X	A	X
Calcium Bisulfite Ca(HSO ₃) ₂	Satíd.	100 A	160 A	200 A	240 A	300 A	X	180 A		70 A	70 A	X	X	C	A	A
Calcium Carbonate CaCO ₃	Satíd.	140 A	160 A	180 A	260 A	300 A	180 A	300 A	70 A	70 A	100 A	X	C	C	C	C
Calcium Chlorate Ca(ClO ₃) ₂ •2H ₂ O	Satíd.	140 A	160 A	180 A	260 A	300 A	140 A	180 A	70 A	70 A	70 A	X	X	C	A	
Calcium Hydroxide Ca(OH) ₂		140 A	180 A	180 A	260 A	220 A	200 A	250 A	70 A	70 A	140 A	X	X	A	A	A
Calcium Sulfate CaSO ₄		140 A	160 A	160 A	240 A	200 A	200 A	200 A	200 A	160 A	180 A	X	X	A	A	A
Camphor C ₁₀ H ₁₆ O		73 A				300 A	200 A	250 A	70 A	X	100 C	X	X	A	A	A
Carbon Dioxide CO ₂	Dry 100%	140 A	185 A	150 A	280 A	360 A	250 A	200 A	200 A	160 A	180 A	A	A	A	A	A
Carbon Dioxide CO ₂	Wet	140 A	185 A	150 A	280 A	360 A	250 A	300 A	200 A	160 A	180 A	A	A	A	A	A
Carbon Disulfide CS ₂		X	X	X	75 A	200 A	X	70 A	70 C	X	70 C	X	A	A	A	C
Carbon Monoxide CO	Gas	140 A	185 A	140 A	275 A	360 A	240 A	240 A	140 A	140 A	180 A	A	X	A	A	A
Carbonic Acid H ₂ CO ₃	Satíd.	140 A	185 A	140 A	280 A	340 A	200 A	200 A			180 A	X	X	A	A	A
Caustic Potash KOH	50%	140 A	185 A	140 A	280 A	340 A	225 A	X	200 A	160 A	180 A		X	A	A	A

CHEMICALS & FORMULAS	CONCENTRATION	PVC	CPVC	PP	PVDF	TFE	EPDM	VITON	HYPALON	NEOPRENE	BUNA	BRASS	CARB. STEEL	400 S.S.	316 S.S	TITANIUM
Caustic Soda NaOH	Up to 40%	140 A	200 A	140 A	X	340 A	180 A	X	140 A	160 A	X	X	X	A	A	A
Chloric Acid HClO ₃ •7H ₂ O	10%	140 C			140 A	140 A		140	180 A	140 A		X	X	X	C	X
Chlorine Gas Cl ₂	Dry 100%	73 A	X	X	220 A	360 A	X	185 A	X	X	X	X	A	C	A	X
Chlorine Gas Cl ₂	Wet 5%	X	X	X	200 A	360 A	X	185 A	X	X	X	X	X	X	X	X
Chlorine	Liquid	X	X		200 A	300 A	X	185 A	70 C	X		X	X	X	X	X
Chlorinated Water	Satid.	140 A	X	73 A	220 A	300 A	X	185 A	70 C	X	X	X	X	X	A	X
Chloroform CHCl ₃	Dry	X	X	X	125 A	200 A	X	70 A	X	X	X	A	X	A	A	A
Chromic Acid H ₂ CrO ₄	50%	X	200 A	180 A	125 A	212 A	X	X	140 A	100 A	X	X	X	X	C	X
Citric Acid C ₆ H ₈ O ₇	Satid.	120 A	120 A	120 A	200 A	200 A	200 A	200 A	120 A	120 A	160 A	X	X	X	A	A
Copper Chloride CuCl ₂	Satid.	140 A	185 A	140 A	280 A	350 A	200 A	200 A	200 A	160 A	160 A	X	X	X	A	X
Copper Fluoride CuF ₂ •2H ₂ O	2%	100 A	120 A	120 A	220 A	200 A	200 A	185 A	140 A	140 A	X	X	X	X	A	A
Copper Nitrate Cu(NO ₃) ₂ •3H ₂ O	30%	140 A	140 A	140 A	240 A	240 A	200 A	200 A	200 A	160 A	X	X	X	X	C	C
Copper Sulfate CuSO ₄ •5H ₂ O	Satid.	140 A	185 A	160 A	280 A	220 A	180 A	200 A	180 A	160 A	180 A	X	X	A	A	A
Corn Syrup		140 A	140 A	140 A	250 A	200 A	160 A	200 A								
Creosote		X	X	X	250 A	350 A	X	73 A	X	X	X	73 A	C	A	A	A
Crude Oil		140 A	185 A		260 A	360 A	X	200 A			70 A	X	X	A	A	A
Cuprous Chloride CuCl	Satid.	140 A	160 A	160 A	250 A	300 A	180 A	220 A	70 A	70 A	180 A	X	X	X	X	A
Detergents (Heavy Duty)		140 A	185 A	150 A			250 A	300 A	200 A	160 A	X	A	A	A	A	A
Dextrin (Starch Gum)	Satid.	140 A	140 A	140 A	250 A	200 A	X	200 A			180 A	A	X	X	A	A
Dextrose		140 A	180 A	180 A	200 A	350 A	140 A	200 A	140 A	160 A	180 A	A	X	X	A	A
Dichlorobenzene C ₆ H ₄ Cl ₂	Pure	X			150 A	150 A	X	100 C	X	X	70 C				A	
Diesel Fuels		120 A			250 A	320 A	X	160 A	X	X	X	A	A	A	A	A

CHEMICALS & FORMULAS	CONCENTRATION	PVC	CPVC	PP	PVDF	TFE	EPDM	VITON	HYPALON	NEOPRENE	BUNA	BRASS	CARB. STEEL	400 S.S.	316 S.S.	TITANIUM
Disodium Phosphate Na ₂ HPO ₄		140 A	175 A	140 A	240 A	360 A	200 A								A	
Ether ROR		X	X	X	70 A			X	X	X	X	X	X	A	A	A
Ethyl Alcohol (Ethanol) C ₂ H ₅ OH		140 A	140 A	185 A	180 A	280 A	210 A	210 A			180 A	180 A	A	A	A	A
Ethyl Chloride C ₂ H ₅ Cl	Dry	X		73 A	250 A	340 A	70 C	175 A	X	70 C	X		A	A	A	A
Ethylene Chloride ClCH ₂ CH ₂ Cl	Dry	X		X	250 A	340 A	70 A	70 A	X	X	X			X	A	A
Ethylene Glycol CH ₂ OHCH ₂ OH		140 A	160 A	120 A	280 A		200 A	250 A	100 A	150 A	180 A	A	A	A	A	A
Fatty Acids R-COOH		140 A	X	80 C	260 A	360 A	X	185 A	X	140 A	100 C	X	X		A	
Ferric Chloride (Aqueous) FeCl ₃	Satid.	140 A	185 A	180 A	280 A	350 A	200 A	200 A	180 A	160 A	180 A	X	X	X	X	X
Ferrous Chloride FeCl ₂	Satid.	140 A	185 A	180 A	280 A	350 A	200 A	200 A			180 A	X	X	X	X	X
Ferrous Nitrate Fe(NO ₃) ₂	Satid.	120 A	160 A	140 A	280 A	360 A	180 A	200 A		160 A	160 A			A	A	A
Ferrous Sulfate FeSO ₄		140 A	180 A	180 A	260 A	360 A	180 A	180 A		160 A	160 A		X	A	A	A
Fish Oil		140 A			200 A	300 A	X	70 A	X	X	70 A		A	A	A	A
Formic Acid HCOOH		73 A	73 A	120 A	240 A	300 A	180 A	X	70 A	120 A	X		X	A	A	A
Gallic Acid C ₆ H ₂ (OH) ₃ CO ₂ H•H ₂ O	Satid.	140 A	73 A		75 A	280 A	70 A	70 A	70 A	70 A	70 A		X	A	A	A
Gasoline, Unleaded		140 A		X	280 A	200 A	X	100 A	70 A		X	A	A	A	A	A
Glycerin C ₃ H ₅ (OH) ₃		140 A	185 A	180 A	280 A	360 A	200 A	300 A	200 A	160 A	X	A	A	A	A	A
Glycol OHCH ₂ CH ₂ OH		140 A	185 A		280 A	300 A	180 A	250 A	180 A	160 A	140 A	A	A	A	A	A
Glycolic Acid OHCH ₂ COOH	Satid.	140 A		140 A	73 A	200 A	70 A	X	X	70 A	X		X		A	
Grape Sugar		140 A	140 A	140 A	200 A	240 A	180 A	185 A								
Hydrobromic Acid HBr	20%	100 A	100 A	120 A	280 A	260 A	120 A	185 A	100 A	70 C	X	X	X	X	X	X
Hydrochloric Acid HCl	35%	140 A	200 A	150 A	260 A	240 A	X	185 A	X	X	X	X	X	X	X	X

CHEMICALS & FORMULAS	CONCENTRATION	PVC	CPVC	PP	PVDF	TFE	EPDM	VITON	HYPALON	NEOPRENE	BUNA	BRASS	CARB. STEEL	400 S.S.	316 S.S.	TITANIUM
Hydrocyanic Acid HCN	10%	140 A	140 A	73 A	260 A	240 A	180 A	185 A	70 A		70 A	X	X	X	A	X
Hydrofluoric Acid HF	Dilute	73 A	73 A	160 A	240 A	260 A	200 A	150 A	X	70 A	X	X	X	X	X	X
Hydrofluoric Acid HF	50%	X	X	73 A	180 A	260 A	X	150 A	120 A	X	X	X	X	X	X	X
Hydrogen	Gas	140 A	140 A	140 A	180 A	300 A	140 A	140 A	180 A	160 A	180 A	A	A	A	A	A
Hydrogen Peroxide H ₂ O ₂	50%	140 A	180 A	140 A	140 A	300 A	100 A	185 A	70 A	70 C	X	X	X	A	A	A
Hydrogen Sulfide H ₂ S	Dry	140 A	185 A	160 A	260 A	240 A	140 A	140 A	140 A	X	140 A	-	X	X	A	A
Hydrogen Sulfide H ₂ S	Wet	140 A	185 A	140 A	220 A			140 A	140 A	X	140 A	X	X	X	A	A
Inks						260 A	70 A	70 A		70 A	70 A	X	X	A	A	A
Iodine I ₂	Satíd.	X	X	140 A	150 A	200 A	X	185 A	X	X	X	X	X	X	X	X
Kerosene		140 A	140 A	73 A	260 A	250 A	X	260 A	X	X	120 A	A	A	A	A	A
Lead Acetate Pb(C ₂ H ₃ O ₂) ₂ •3H ₂ O	Satíd.	140 A	185 A	180 A	260 A	300 A	200 A	100 C	X	160 A	180 A		X	A	A	A
Lead Nitrate Pb(NO ₃) ₂	Satíd.	140 A	185 A	180 A	250 A	300 A	160 A	200 A			180 A		A	A	A	A
Linseed Oil		140 A	185 A	150 A	280 A	300 A	X	220 A	X	70 A	160 A					
Lithium Bromide LiBr	50%	140 A			240 A	280 A		200 A			120 A	A	A	A	A	A
Magnesium Carbonate MgCO ₂		140 A	140 A	160 A	240 A	220 A	X	220 A			140 A	X	X	A	A	A
Magnesium Chloride MgCl ₂	Satíd.	140 A	185 A	180 A	260 A	360 A	220 A	200 A	180 A	150 A	180 A	X	X	X	X	X
Magnesium Nitrate Mg(NO ₃) ₂ •2H ₂ O		140 A	185 A	180 A	280 A	300 A	140 A	225 A		160 A	70 A		X	A	A	A
Magnesium Sulfate MgSO ₄ •7H ₂ O		140 A	185 A	180 A	280 A	300 A	160 A	225 A	140 A	140 A	160 A	A	A	A	A	A
Mercuric Chloride HgCl ₂		140 A	140 A	160 A	250 A	300 A	200 A	185 A	140 A		140 A	X	X	X	X	X
Mercuric Cyanide Hg(CN) ₂	Satíd.	140 A	160 A	160 A	250 A	300 A	180 A	70 A			70 A	X	X	X	A	A
Mercury Hg		140 A	180 A	160 A	260 A	300 A	180 A	185 A	140 A	140 A	140 A	X	A	A	A	A
Milk		X	X	140 A	225 A	360 A	240 A	280 A	180 A	160 A	180 A	X	X	X	A	A

CHEMICALS & FORMULAS	CONCENTRATION	PVC	CPVC	PP	P/DF	TFE	EPDM	VITON	HYPALON	NEOPRENE	BUNA	BRASS	CARB. STEEL	400 S.S.	316 S.S	TITANIUM
Mineral Oil		120 A	160 A	120 A	260 A	300 A	X	260 A	70 C	70 A	140	A A	A	A	A	A
Molasses		140 A		73 A	150 A	260 A	X	185 A	X	X	70 A	A	A	A	A	A
Motor Oil		140 A	185 A	73 A	220 A	320 A	X	240 A	X	X	180 A	A	A	A	A	A
Nickel Nitrate Ni(NO ₃) ₂ •6H ₂ O	Satíd.	140 A			260 A	360 A	200 A	250 A			180 A		X	A	A	X
Nickel Sulfate NiSO ₄	Satíd.	140 A	185 A	180 A	280 A	360 A	200 A	280 A	200 A	160 A	140 A		X		C	C
Nitric Acid HNO ₃	10%	140 A	185 A	160 A	200 A	250 A	70 A	185 A	100 A	X	X	X	X	X	A	A
Nitric Acid HNO ₃	50%	120 A	73 A	73 A	130 A	240 A	X	185 A	70 A	X	X	X	X	X	A	A
Nitric Acid HNO ₃	100%	X	X	X	70 A	70 A	X	X	X	X	X	X	X	X	A	A
n-Octane CH ₈ H ₁₈					260 A	360 A	X	70 A		70 C	70 C	A	A	A	A	A
Oleic Acid CH ₃ (CH ₂) ₇ CH=CH(CH ₂) ₇ COOH		140 A	160 A	240 A	250 A	X	X	85 A	X	70 C	100 A	X	X	A	X	
Oxygen (Gas) O ₂		120 A	160 A	140 A	240 A	380 A	200 A	185 A	140 A	140 A	70 C	A	A	A	A	A
Ozone O ₃		X	X	X	240 A	300 A	200 A	185 A	140 A	X	X	A	A	A	A	A
Phosphoric Acid H ₃ PO ₄	85%	120 A	73 A	160 A	240 A	300 A	70 A	200 A	180 A	X	X	X	X	X	A	A
Photographic Solutions		140 A	180 A	150 A	220 A	260 A		185 A	100 A	100 A		X	X	X	A	A
Pine Oil								70 C		X	70 A	X	X	A	A	A
Plating Solutions (Brass)		140 A	185 A	180 A	200 A	300 A	70 A	70 A		100 A					A	A
Plating Solutions (Cadmium)		140 A	185 A	180 A	200 A	300 A	200 A	200 A		100 A					A	X
Plating Solutions (Chrome)		140 A	210 A	180 A	200 A	300 A				160 A					X	X
Platings Solutions (Copper)		140 A	210 A	180 A	200 A	300 A	70 A	70 A		160 A					A	A
Potassium Chlorate KClO ₃ (Aqueous)		140 A	140 A	140 A	200 A	360 A	120 A	140 A	140 A	100 A	X		A	A	A	A
Potassium Chloride KCl		140 A	180 A	180 A	250 A	360 A	200 A	200 A	180 A	160 A	180 A	X	X	C	A	A
Potassium Chromate K ₂ CrO ₄		140 A	140 A	160 A	220 A	360 A	70 A	220 A	70 A	70 A	160 A	X	X	X	C	A

CHEMICALS & FORMULAS	CONCENTRATION	PVC	CPVC	PP	PVDF	TFE	EPDM	VITON	HYPALON	NEOPRENE	BUNA	BRASS	CARB. STEEL	400 S.S.	316 S.S	TITANIUM
Potassium Cyanide KCN	Satid.	140 A	160 A	140 A	260 A	360 A	140 A	185 A	180 A	140 A	160 A	X	X	A	A	A
Potassium Dichromate K ₂ Cr ₂ O ₇	Satid.	140 A	160 A		260 A	360 A	200 A	220 A			160 A	X	X	A	A	A
Potassium Hydroxide KOH	25%	140 A	180 A	150 A	140 A	360 A	180 A	140 A	140 A	160 A	70 C	X	X	A	A	A
Potassium Nitrate KNO ₃		140 A			260 A	360 A	200 A	240 A	140 A	140 A	180 A	X	X	A	A	A
Potassium Sulfate K ₂ SO ₄		140 A		180 A	240 A	200 A	200 A	240 A	140 A	140 A	140 A	X	A	A	A	A
Potassium Sulfide K ₂ S					260 A	280 A		100 A		70 A	100 A	X	X	X	X	X
Propane C ₃ H ₈		140 A	73 A		260 A	280 A	X	70 A	70 C	70 A	70 A	A	A	A	A	A
Propyl Acetate C ₃ H ₇ OOCCH ₃					100 A	140 A	70 C	X	X	X	X	A	A	A	A	A
Propyl Alcohol CH ₃ CH ₂ CH ₂ OH					150 A	320 A	140 A	250 A	140 A	140 A	140 A	A	A	A	A	A
Propylene Oxide CH ₃ (CHCH ₂)O		X			X	150 A	70 A	X	X	X	X	X	A	C	A	A
Pyridine N(CH) ₄ CH		X		73 A	X		70 C	X	X	X	X	X	X	X	X	X
Rosin						200 A		100 A	70 A	70 A	70 A		X	A	A	A
Sewage		140 A	160 A	160 A	240 A	300 A	150 A	180 A	120 A	120 A	110 A	A	X	A	A	A
Silicic Acid SiO ₂ •nH ₂ O		140 A	160 A	160 A	240 A	360 A	140 A	200 A	140 A	140 A	100 A					
Silicone Oil		140 A	140 A	160 A	240 A	340 A	140 A	185 A	140 A	70 A	140 A	A	A	A	A	A
Silver Cyanide AgCN		140 A	180 A	180 A	280 A	340 A	140 A	140 A	X	70 A	70 A	X	X			
Silver Nitrate AgNO ₃		140 A	180 A	180 A	280 A	340 A	200 A	250 A	200 A	160 A	140 A	X	X	X	A	A
Silver Sulfate Ag ₂ SO ₄		140 A	160 A	140 A	250 A	340 A	200 A	240 A	X	X	140 A					
Soaps		140 A	180 A	140 A	240 A	360 A	200 A	250 A	140 A	140 A	180 A	X	X	A	A	A
Sodium Acetate NaC ₂ H ₃ O ₂	Satid.	140 A	185 A	180 A	280 A	400 A	210 A	X	X		70 A	X	X	X	A	A
Sodium Benzoate C ₆ H ₅ COONa		140 A	140 A	160 A	240 A	300 A	200 A	200 A			140 A				A	A
Sodium Bicarbonate NaHCO ₃		140 A	180 A	180 A	260 A	360 A	210 A	280 A	200 A	160 A	180 A	X	X	A	A	A

CHEMICALS & FORMULAS	CONCENTRATION	PVC	CPVC	PP	PVDF	TFE	EPDM	VITON	HYPALON	NEOPRENE	BUNA	BRASS	CARB. STEEL	400 S.S.	316 S.S	TITANIUM
Sodium Bichromate $\text{Na}_2\text{Cr}_2\text{O}_7 \cdot 2\text{H}_2\text{O}$	Satid.	140 A	140 A	140 A	240 A	360 A	140 A	200 A	-	-	140 A	X	X	A	A	A
Sodium Bisulfate NaHSO_4		140 A	160 A	140 A	240 A	240 A	200 A	240 A	100 A	X	180 A	X	X	X	A	A
Sodium Bisulfite NaHSO_3		140 A	185 A	180 A	240 A	360 A	200 A	250 A	200 A	140 A	180 A	X	X	-	A	A
Sodium Borate (Borax) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$	Satid.			200 A	240 A	280 A	140 A	180 A			70 A	X	X	X	A	A
Sodium Bromide NaBr	Satid.	140 A	180 A	180 A	280 A	300 A	210 A	250 A	X	70 A	X	X	X	X	A	A
Sodium Carbonate Na_2CO_3		140 A	180 A	180 A	280 A	360 A	140 A	300 A	140 A	140 A	140 A	X	A	A	A	A
Sodium Chlorate NaClO_3	Satid.	140 A	160 A	160 A	240 A	300 A	140 A	180 A	X	140 A	X		A	A	A	A
Sodium Chloride NaCl		140 A	200 A	180 A	260 A	300 A	140 A	180 A	X	140 A	140 A	A	X	A	A	A
Sodium Ferricyanide $\text{Na}_3\text{Fe}(\text{CN})_6 \cdot 2\text{H}_2\text{O}$	Satid.	100 A	140 A	140 A	240 A	320 A	140 A	180 A	X	X	70 A			A	A	A
Sodium Hydroxide NaOH	15%	140 A	160 A	160 A	100 A	360 A	200 A	100 C	140 A	140 A	140 A	A	A	A	A	A
Sodium Hydroxide NaOH	50%	140 A	140 A	140 A	X	320 A	160 A	X	100 A	100 A	180 A	X	X	A	A	A
Sodium Hypochlorite $\text{NaOCl} \cdot 5\text{H}_2\text{O}$		100 A	100 A	120 A	140 A	320 A	X	X	X	X	X	X	X	X	A	X
Sodium Nitrate NaNO_3	Satid.	140 A	185 A	180 A	240 A	360 A	200 A	220 A	140 A	140 A	140 A	X	A	A	A	A
Sodium Nitrite NaNO_2	Satid.	120 A	140 A	160 A	240 A	360 A	200 A	200 A	140 A	140 A	X	X	X		A	A
Sodium Perchlorate NaClO_4		120 A	140 A	140 A	240 A	300 A										
Sodium Peroxide Na_2O_2		120 A	140 A	140 A	230 A	230 A	120 A	160 A	X	70 A	X	X	X	A	A	A
Sodium Sulfate Na_2SO_4	Satid.	140 A	185 A	160 A	280 A	360 A	140 A	200 A	140 A	140 A	140 A	A	A	A	A	A
Sodium Sulfite Na_2SO_3		140 A	180 A	180 A	260 A	320 A	140 A	200 A	140 A	140 A	140 A	X	X	X	A	A
Soybean Oil		120 A	140 A	140 A	240 A	360 A	140 A	160 A	X	X	140 A	-	-	A	A	A
Stannic Chloride SnCl_4		140 A	160 A	140 A	260 A	320 A	100 A	200 A	70 A	140 A	140 A	X	X	X	X	X
Starch		140 A	160 A	160 A	220 A	300 A	180 A	200 A	180 A	160 A	160 A	X	X	A	A	A
Stearic Acid $\text{CH}_3(\text{CH}_2)_{16}\text{COOH}$		120 A	140 A	73 A	260 A	320 A	X	140 A	70 A	70 A	140 A	X	X	A	A	A

CHEMICALS & FORMULAS	CONCENTRATION	PVC	CPVC	PP	PVDF	TFE	EPDM	VITON	HYPALON	NEOPRENE	BUNA	BRASS	CARB. STEEL	400 S.S.	316 S.S	TITANIUM
Sugar C ₆ H ₁₂ O ₆					250 A	320 A	140 A	180 A	140 A	140 A	100 A	X	X	A	A	A
Sulfur S		120 A	140 A	X	240 A	320 A	X	120 A	X	X	X	X	X	X	A	X
Sulfur Dioxide SO ₂	Wet	100 A	140 A	140 A	200 A	240 A	140 A	140 A	X	X	X	X	X	X	A	X
Sulfuric Acid H ₂ SO ₄	Up to 30%	140 A	180 A	180 A	240 A	240 A	140 A	210 A	X	X	X	X	X	X	A	A
Sulfuric Acid H ₂ SO ₄	50%	140 A	180 A	160 A	240 A	240 A	140 A	210 A	70 A	X	140 A				A	
Sulfuric Acid H ₂ SO ₄	70%	140 A	160 A	140 A	200 A	200 A	120 A	180 A	70 A	70 A	70 A	X	X	X	X	X
Sulfuric Acid H ₂ SO ₄	95%	X	73 A	X	140 A	100 C	X	100 A	X	X	X	X	X	X	X	X
Sulfuric Acid H ₂ SO ₄	100%	X	X	X	X	100 C	X	X	X	X	X	X	X	X	X	X
Sulfurous Acid H ₂ SO ₃		120 A	120 A	140 A	220 A	320 A	140 A	120 A	100 A	X	70 C	X	X	X	A	A
Tannic Acid C ₇₆ H ₅₂ O ₄₆		120 A	140 A	180 A	240 A	240 A	100 A	100 A	100 A	100 A	100 A	X	X	C	A	A
Tanning Liquors		100 A	140 A	140 A	100 A	100 A	X	100 A	X	X	X	X	X	X	A	A
Tar		X	X	X	220 A	220 A	X	185 A	70 A	70 A	70 A	A	A	A	A	A
Tartaric Acid HOOC(CHOH) ₂ COOH		120 A	120 A	120 A	220 A	220 A	X	180 A	70 A	70 A	70 A	X	X	A	A	A
Tetraethyl Lead (C ₂ H ₅) ₄	Pure	X	X	X	240 A	320 A	X	100 A	X	X	X	X	X	X	C	C
Toluene (Toluol) CH ₃ C ₆ H ₅		X	X	X	120 A	160 A	X	100 C	X	X	100 A	A	A	A	A	A
Tomato Juice		140 A	X	160 A	220 A	320 A	200 A	200 A	X	70 A	X	X	X	A	A	A
Triethanolamine (HOCH ₂ CH ₂) ₃ N		X	X	X	70 A	X	70 A	70 A	X	X	X	X	X	A	A	A
Trisodium Phosphate NaPO ₄ •12H ₂ O		140 A	160 A	160 A	240 A	320 A	70 A	160 A	X	X	70 A	X	X	A	A	A
Turpentine		100 A	73 A	X	250 A	220 A	X	100 A	70 A	X	70 A	A	A	A	A	A
Urea CO(NH ₂) ₂	30%	140 A	180 A	180 A	240 A	240 A	200 A	120 A	100 A	100 A	100 A	X	X	-	A	-
Urine		140 A	180 A	180 A	180 A	320 A	200 A	120 A	140 A	140 A	120 A	X	X	A	A	A
Varnish		X	X	X	240 A	320 A	X	70 A	X	X	70 A	C	X	C	A	A

CHEMICALS & FORMULAS	CONCENTRATION	PVC	CPVC	PP	PVDF	TFE	EPDM	VITON	HYPALON	NEOPRENE	BUNA	BRASS	CARB. STEEL	400 S.S.	316 S.S	TITANIUM
Vegetable Oil		100 A	100 A	73 A	240 A	260 A	X	160 A	70 A	70 A	70 A		A	A	A	A
Vinegar		160 A	160 A	140 A	200 A	260 A	180 A	160 A	180 A	X	X	X	X	A	A	A
Water, Acid Mine H ₂ O		140 A	180 A	140 A	220 A	360 A	200 A	185 A	140 A	140 A	140 A	X	X	A	A	A
Water, Deionized H ₂ O		140 A	180 A	180 A	260 A	360 A	250 A	180 A				X	X	C	A	A
Water, Distilled H ₂ O		140 A	180 A	180 A	260 A	360 A	180 A	200 A	180 A	140 A	180 A	X	X	A	A	A
Water, Potable H ₂ O		140 A	180 A	180 A	260 A	360 A	180 A	300 A	180 A	140 A	180 A	A	C	A	A	A
Water, Salt H ₂ O		140 A	180 A	180 A	240 A	300 A	220 A	240 A	180 A	140 A	180 A	X	X	C	A	A
Water, Sea H ₂ O		140 A	180 A	180 A	260 A	360 A	220 A	240 A	180 A	140 A	180 A	X	X	C	A	A
Water, Soft H ₂ O		140 A	180 A	180 A	260 A	360 A	220 A	240 A	180 A	140 A	180 A	X	X	A	A	A
Water, Waste H ₂ O		140 A	185 A	180 A	230 A	360 A	200 A	200 A				X	X	A	A	A
Whiskey		140 A	180 A	160 A	200 A	340 A	180 A	140 A			140 A	X	X	X	A	
Wine		120 A	140 A	140 A	240 A	320 A	170 A	120 A		120 A	70 A	X	X	X	A	
Zinc Acetate Zn(C ₂ H ₃ O ₂) ₂ •2H ₂ O		140 A	160 A	160 A	240 A	280 A	180 A	140 A	X	140 A	70 A	X	X	C	A	A
Zinc Chloride ZnCl ₂		140 A	160 A	160 A	240 A	360 A	160 A	200 A	140 A	160 A	70 A	X	X	X	C	A
Zinc Nitrate Zn(NO ₃) ₂ •6H ₂ O		140 A	160 A	160 A	240 A	240 A	160 A	200 A	180 A		140 A	X	X	A	A	A
Zinc Sulfate ZnSO ₄ •7H ₂ O		140 A	180 A	180 A	240 A	360 A	160 A	200 A	180 A	140 A	140 A	X	X	A	A	A



**THERMOPLASTIC
VALVES INC.**

6" BF-V W/MANUAL GEAR & 2" SQUARE NUT

**DWN BY
CKP**

**DATE
1-96**

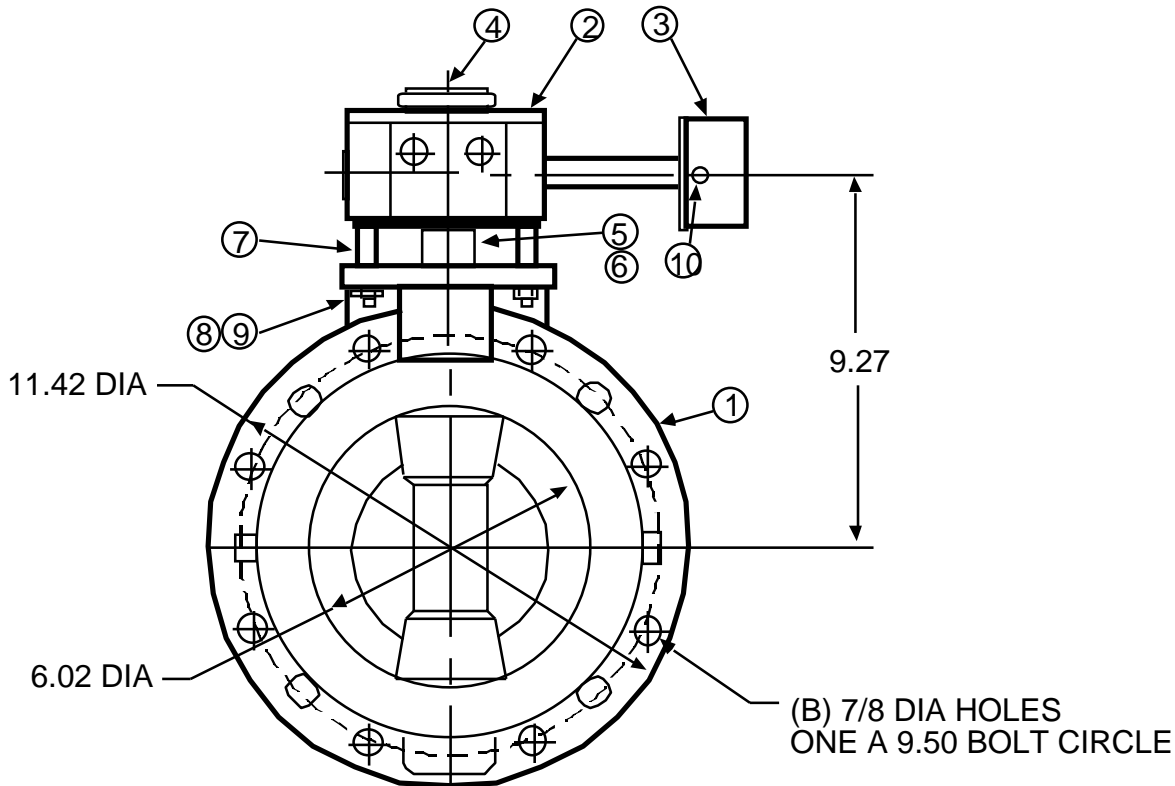
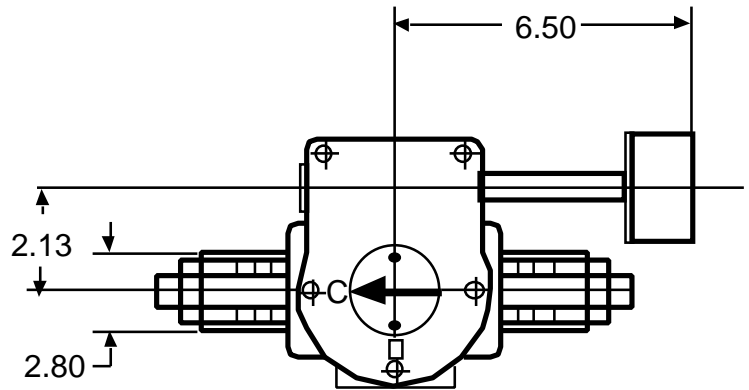
**DWG NO.
102BFAOGN**

**CERTIFIED
CORRECT FOR GENERAL DIMENSIONS**

Date _____ Per: _____

Materials of Construction

Item	Parts	Pcs	Materials
1	Valve	1	6" BFV
2	Gear	1	WOG-1
3	2" Sq. Nut	1	STEEL
4	Key	1	1/4 x 2"
5	Adapter	1	CARBON STL
6	Pin	1	1/4 x 1.25
7	Spacer	4	3/B PIPE X 1.06
8	Nut	4	3/B-16 UNC HEX
9	THD Rod	4	3/B-16 X 3.00
10	Pin	1	1/4 Dia x 1.25





**THERMOPLASTIC
VALVES INC.**

BUTTERFLY VALVE W/ THREADED LUG INSERTS

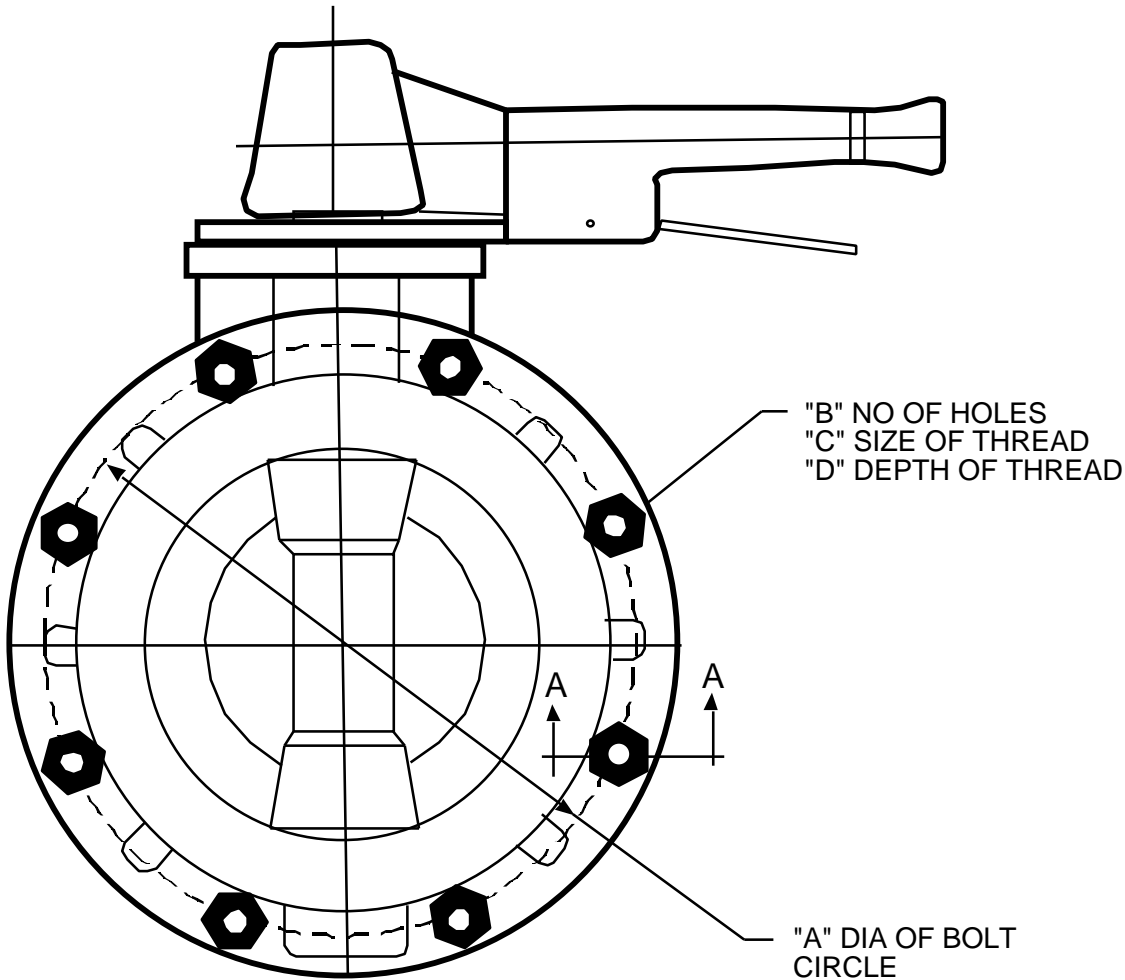
**DWN BY
CKP**

**DATE
1-96**

**DWG NO.
102 BFAOTL**

**CERTIFIED
CORRECT FOR GENERAL DIMENSIONS**

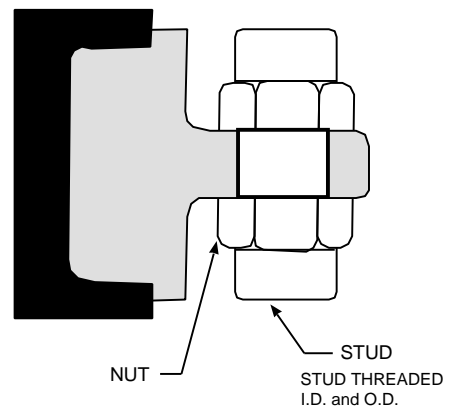
Date _____ Per: _____



Materials of Construction

SIZE	A	B	C	D
4	7.50	8	1/2-13	.75
6	9.50	8	5/8-11	1.00
8	11.75	8	5/8-11	1.00
12	17.00	12	3/4-10	1.00

SECTION A-A





**THERMOPLASTIC
VALVES INC.**

6" BF-V W/2" SQUARE NUT

**DWN BY
CKP**

**DATE
1-96**

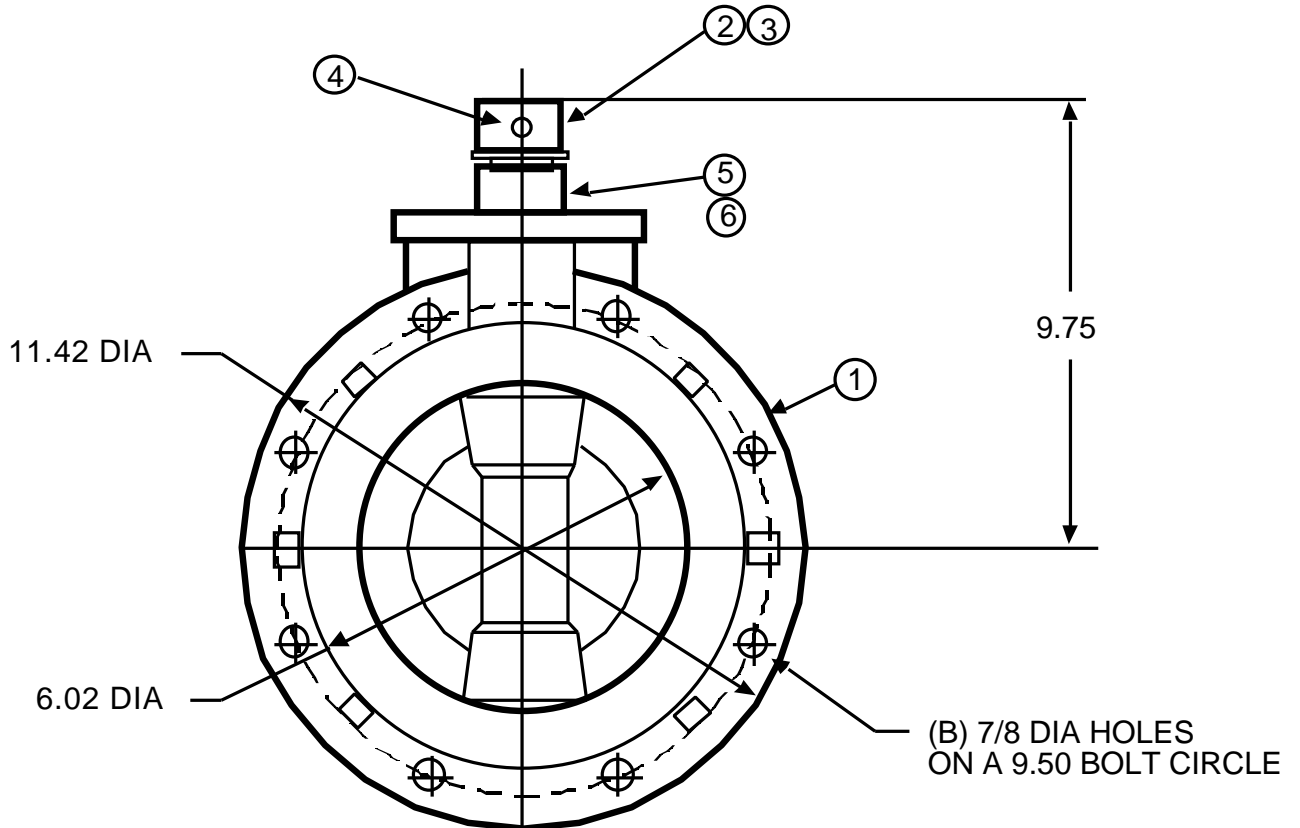
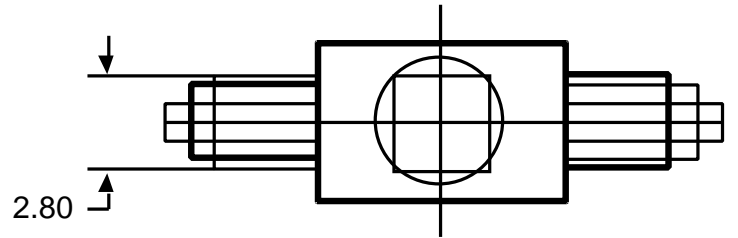
**DWG NO.
102BF**

**CERTIFIED
CORRECT FOR GENERAL DIMENSIONS**

Date _____ Per: _____

Materials of Construction

Item	Parts	Pcs	Materials
1	Valve	1	6" BFV
2	2" sq. Nut	1	Steel
3	Stop Pin	1	1/4 Dia. x 2" LG
4	DRV Loc Pin	1	1/4 Dia. x 2" LG
5	STOP PLATE	1	PVC
6	FL HD SCR	2	Steel

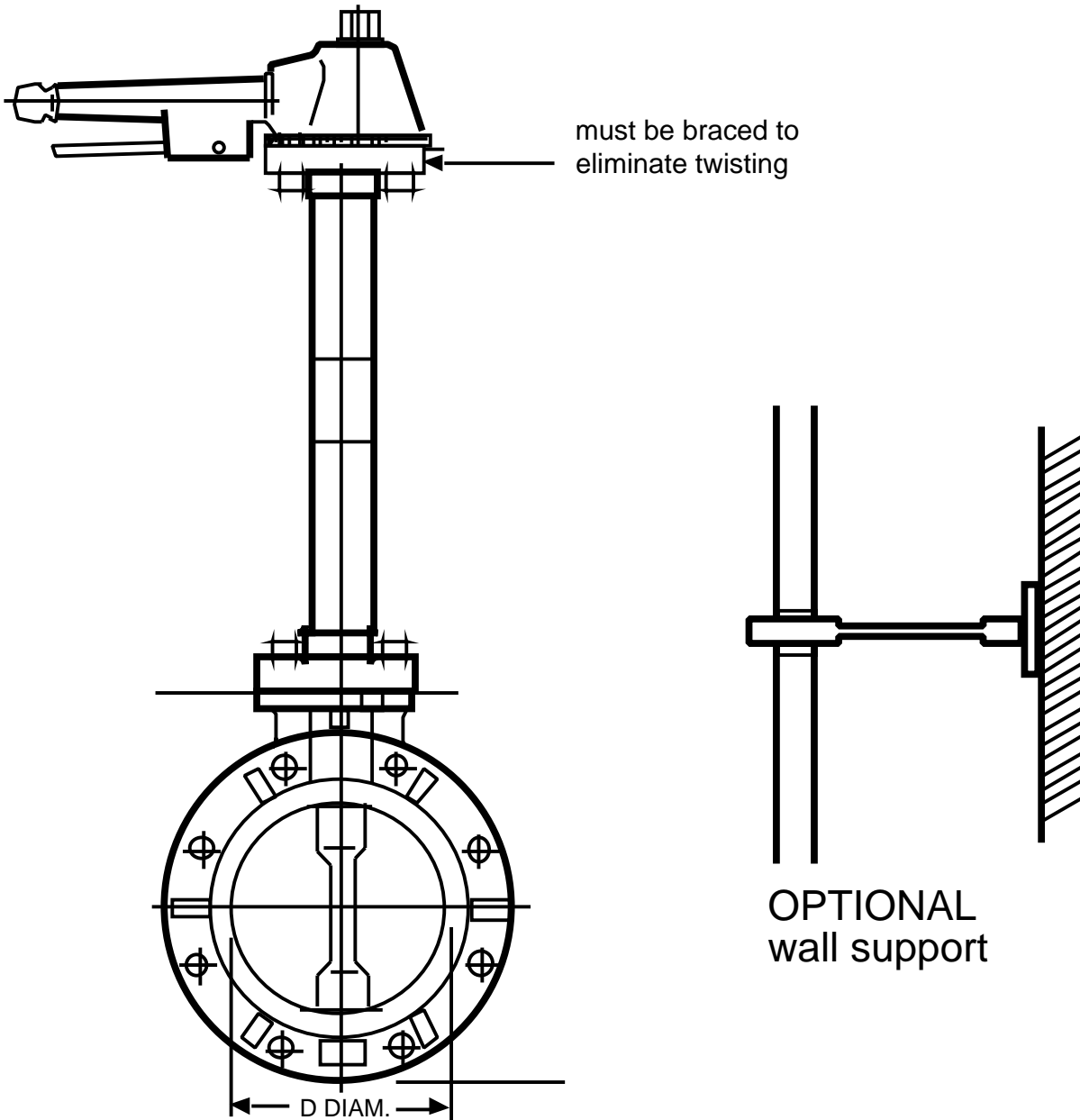


TVI THERMOPLASTIC VALVES INC.
**TYPICAL BUTTERFLY VALVE W/
 EXTENSION STEM**

DWN BY CKP	DATE 1-96	DWG NO. 110 BFAO
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**CERTIFIED
 CORRECT FOR GENERAL DIMENSIONS**

Date _____ Per: _____



standard-two piece stem



**THERMOPLASTIC
VALVES INC.**

**TYPICAL BUTTERFLY VALVE W/
2 PC. EXT. & GEAR UNIT**

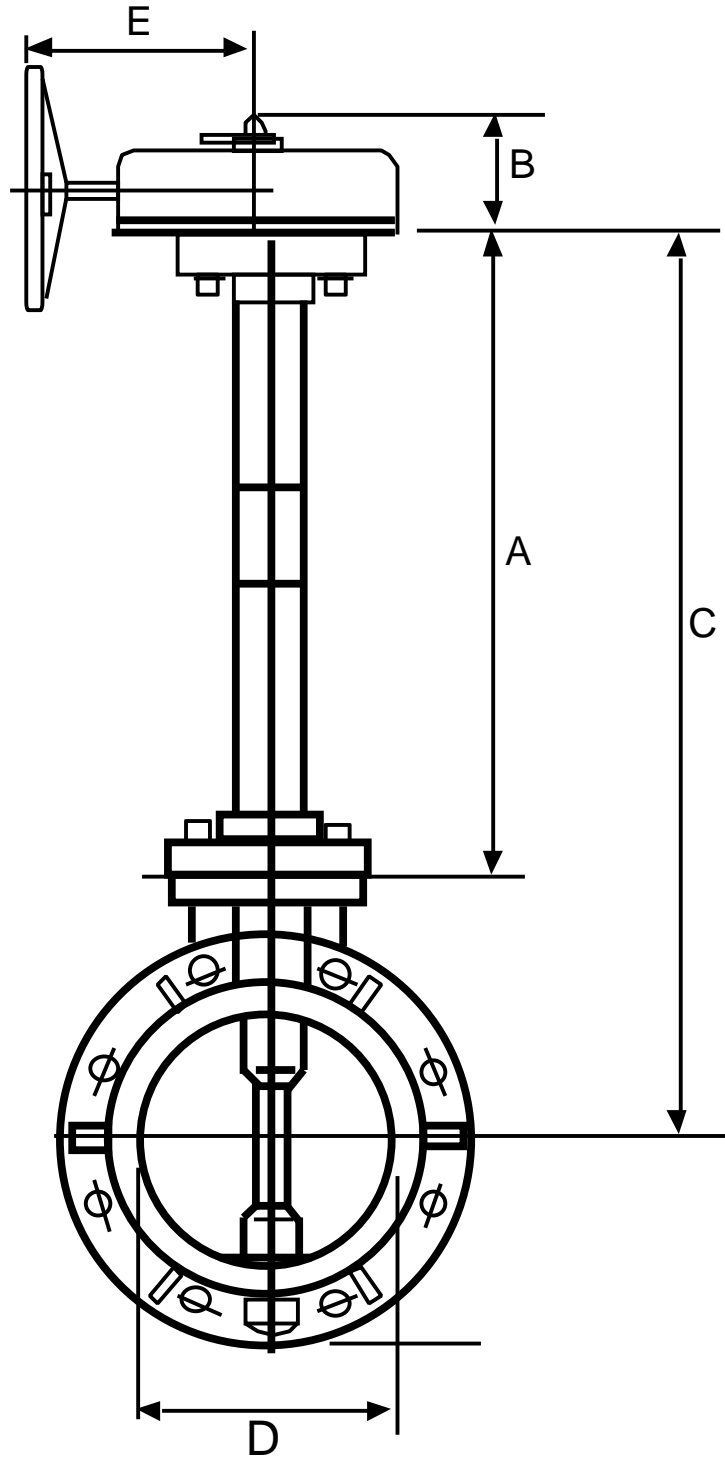
**DWN BY
CKP**

**DATE
1-96**

**DWG NO.
102 BFAO**

CERTIFIED CORRECT FOR GENERAL DIMENSIONS

Date _____ Per: _____



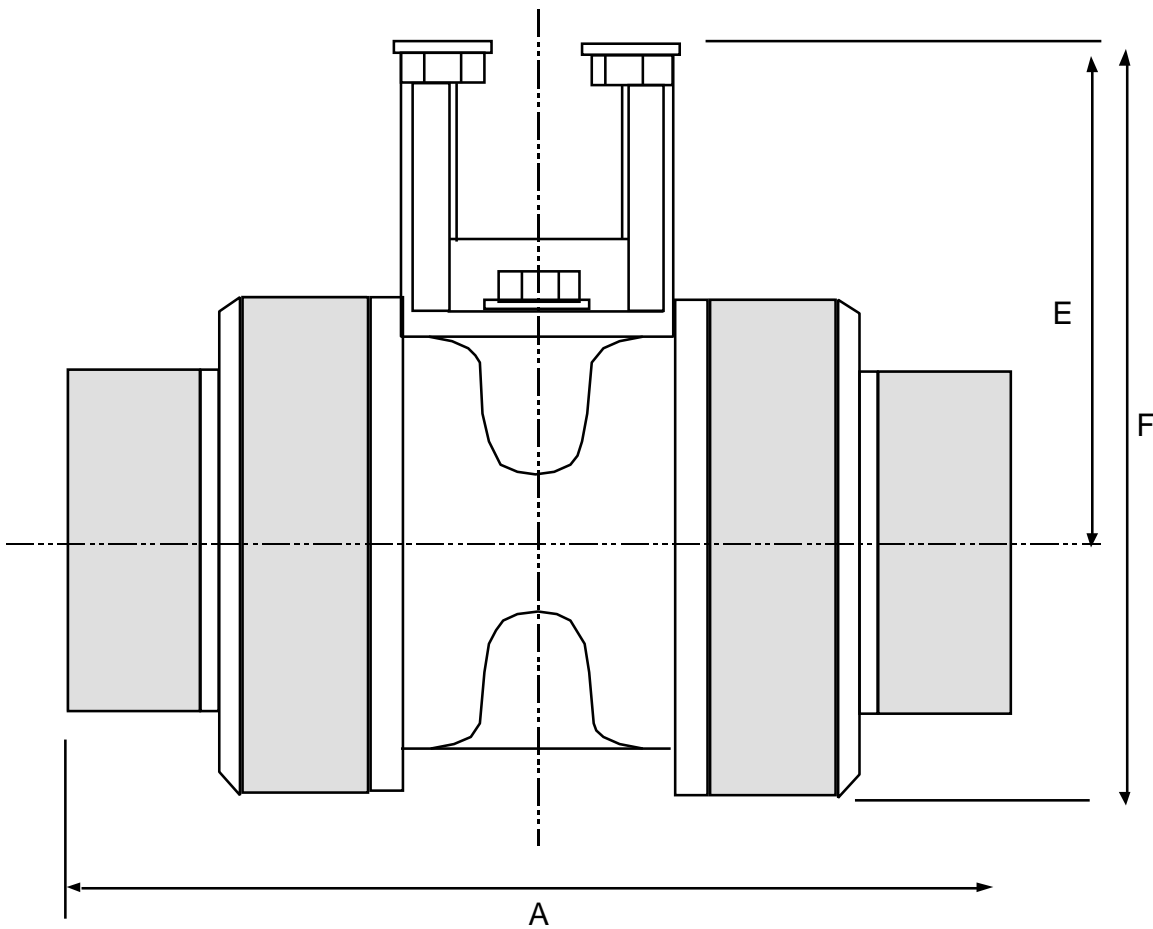
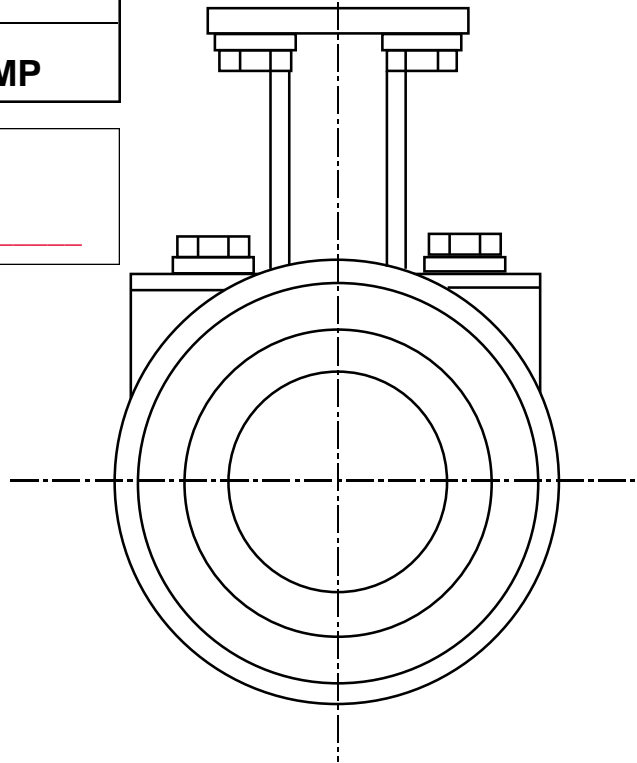
TVI THERMOPLASTIC VALVES INC.

4" SBTU BALL VALVE W/MTG. PAD FOR ACTUATOR

DWN BY CKP	DATE 1-96	DWG NO. 106-BVAOMP
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**CERTIFIED
CORRECT FOR GENERAL DIMENSIONS**

Date _____ Per: _____



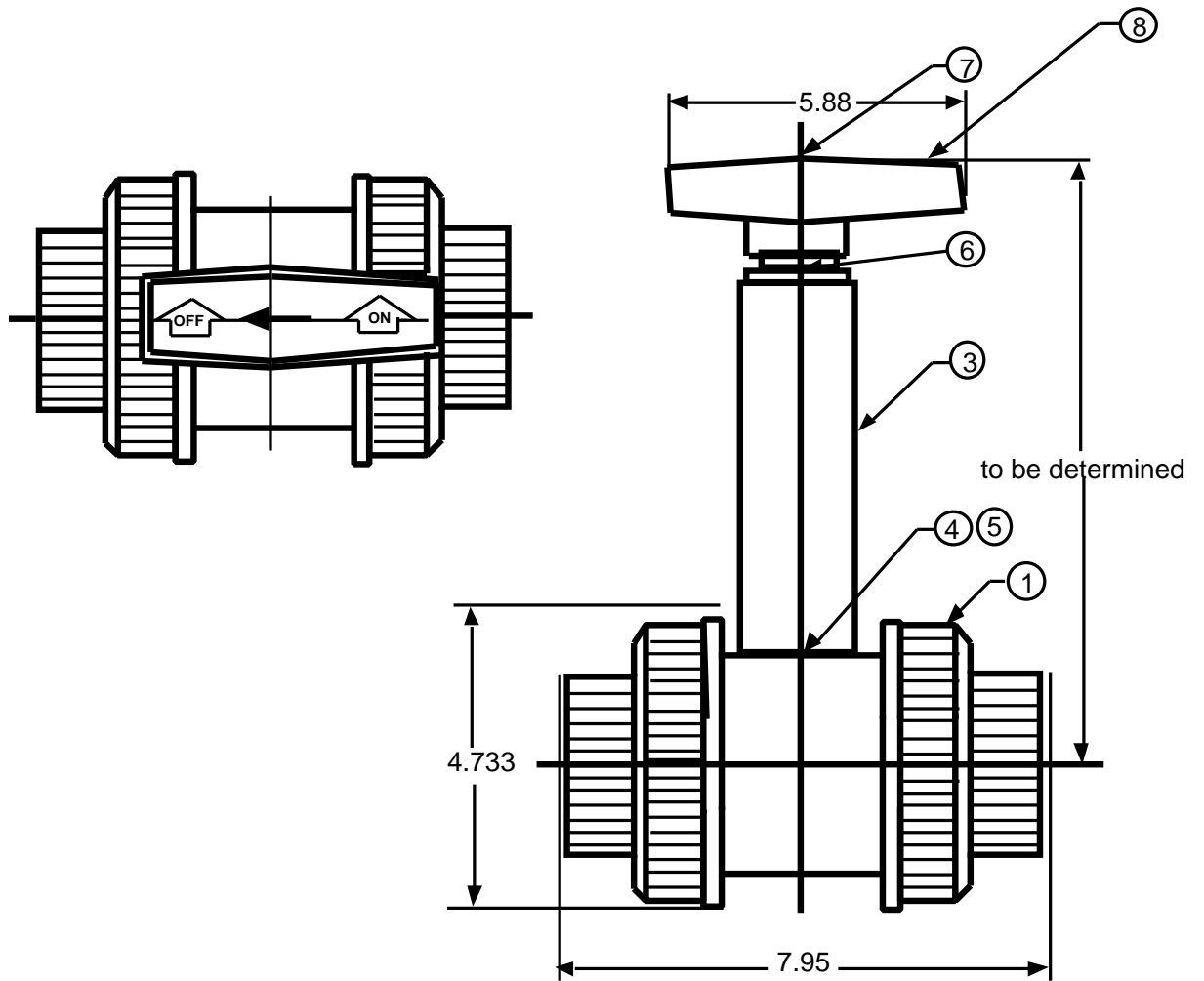
TVI THERMOPLASTIC VALVES INC.
ARRANGEMENT DRAWING

TYPICAL BALL VALVE W/ STEM EXTENSION

DWN BY CKP	DATE 1-96	DWG NO. 106-TUSBVAO
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**CERTIFIED
CORRECT FOR GENERAL DIMENSIONS**

Date _____ Per: _____



Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials
1	Valve	1	PVC / EPDM	6	Bushing	1	EPDM,VITON®
2	Housing	1	PVC	7	FLT SCR	1	PVC
3	Extension	1	18-8 SS	8	Handle	1	ABS
4	Coupling	1	18-8 SS				
5	Pin	2	18-8 SS				

**ARRANGEMENT DRAWING
TYPICAL BALL VALVE W/ EXT.
FLOOR STAND-OPERATOR**

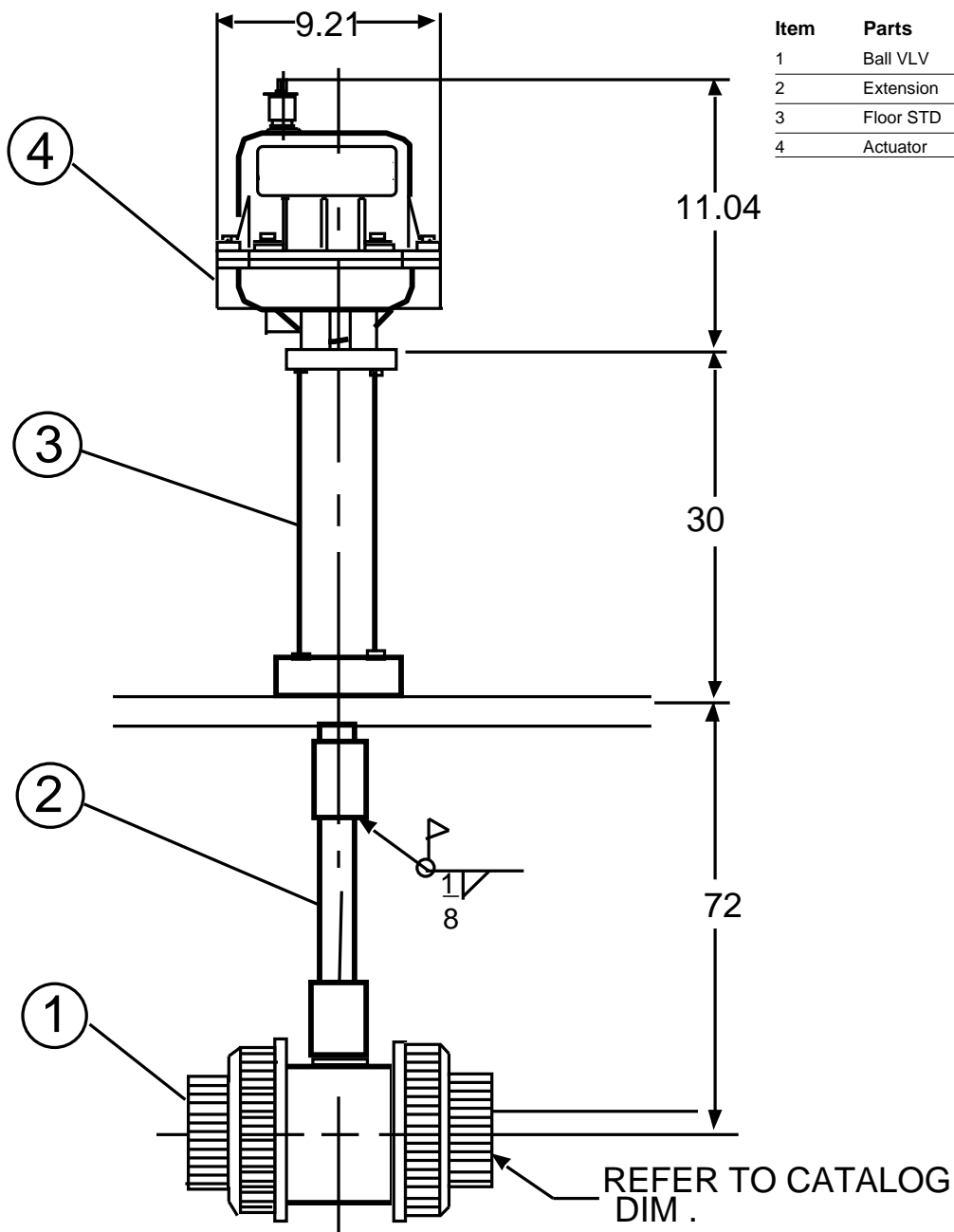
DWN BY CKP	DATE 1-96	DWG NO. 106-TUSBBVAOE
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CERTIFIED CORRECT FOR GENERAL DIMENSIONS

Date _____ Per: _____

Materials of Construction

Item	Parts	Pcs	Materials
1	Ball VLV	1	PVC
2	Extension	1	Carbon STL
3	Floor STD	1	Carbon STL
4	Actuator	1	Several





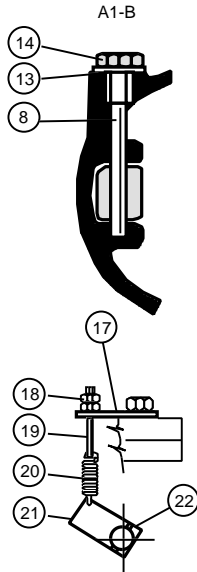
THERMOPLASTIC VALVES INC.

**ARRANGEMENT DRAWING
HORIZONTAL SWING CHECK VALVE**

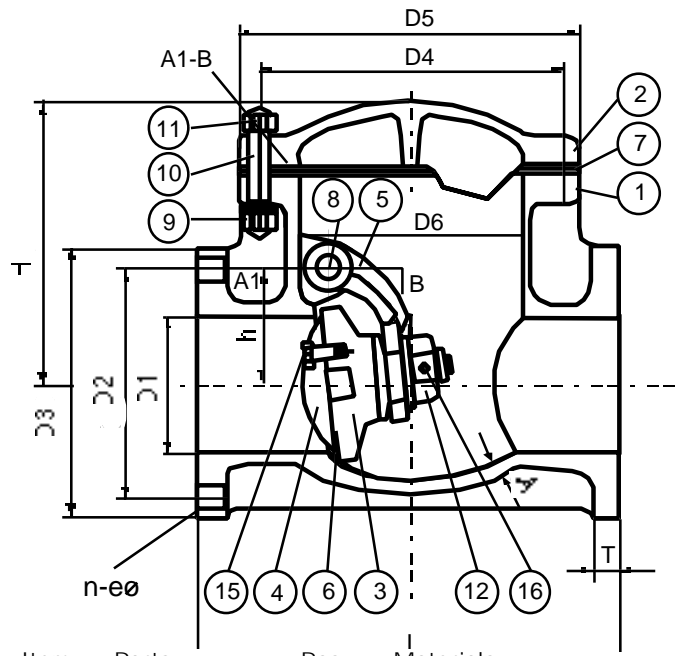
SIZE: 3/4" - 8"

DWN BY CKP	DATE 1-96	DWG NO. 105-HSCV
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CERTIFIED
CORRECT FOR GENERAL DIMENSIONS Date _____ Per: _____



Adjustable
Spring
Assist
Option



Materials of Construction

Item	Parts	Pcs	Materials	Item	Parts	Pcs	Materials	
1	Body	1	PVC,PP,PPG,PVDF	12	Disc Holder	1	PVC,PP,PPG,PVDF	
2	Bonnet	1	PVC,PP,PPG,PVDF	13	O-ring	1	EPDM,VITON®	
3	Disc	1	PVC,PP,PPG,PVDF	14	Shaft Holder	1	PVC,PP,PPG,PVDF	
4	Sheet Gasket Holder	1	PVC,PP,PPG,PVDF	15	Set Bolts	1" - 2" 1 5" - 6" 4	2 1/2" - 4" 3 8" 8	PVC, PP PPG, PVDF
5	Swing Arm	1	PVC,PP,PPG,PVDF	16	Set Pin	1	PVC, PP, PPG, PVDF	
6	Disc Gasket	1	EPDM,VITON®TFE	17	Bracket	1	316 Stainless Steel	
7	Bonnet Gasket	1	EPDM,VITON®	18	Nut	1	316 Stainless Steel	
8	Shaft	1	PVC,PP,PPG,PVDF	19	Adjustment Stem	1	316 Stainless Steel	
9	Washer	1" - 3"	6 sets	SUS304	20	Spring	1	316 Stainless Steel
10	Bolts	4" - 8"	8 sets	SUS304	21	Lever	1	PVC
11	Nuts			SUS304	22	Pin	1	316 Stainless Steel

VITON® and TEFLON® are trademarks of Dupont Dow Elastomers

Ansi Dimensions

Size Inch	D1	D2	D3	e	n No. of holes	D4	D5	D6	L	T	A	h	H	D	Test Press (PSI)	Working Press (PSI)
3/4"	1.00	2.75	3.875	0.63	4	4.34	5.13	2.97	6.31	0.50	0.25	1.56	4.72	0.31	150	100
1	1.00	3.13	4.25	0.63	4	4.34	5.13	2.97	6.31	0.59	0.25	1.56	4.72	0.31	150	100
1 1/2"	1.63	3.88	5.00	0.63	4	4.94	5.72	3.34	7.09	0.63	0.31	1.78	5.44	0.31	150	100
2"	2.06	4.75	6.00	0.75	4	6.09	7.09	4.13	7.88	0.83	0.31	2.16	6.46	0.41	150	100
2 1/2"	3.16	5.50	7.00	0.75	4	7.13	8.06	5.13	10.25	0.83	0.34	2.75	6.72	0.47	150	100
3"	3.16	6.00	7.50	0.75	4	7.13	8.06	5.13	10.25	0.83	0.34	2.75	6.72	0.47	150	100
4"	3.94	7.50	9.00	0.75	8	9.25	10.44	6.69	11.93	0.87	0.41	3.53	8.38	0.63	100	70
5"	4.94	8.50	10.00	0.88	8	11.22	13.00	8.28	13.78	0.87	0.56	4.34	9.38	0.72	100	70
6"	5.53	9.50	11.00	0.88	8	13.00	14.56	9.84	15.75	0.91	0.63	5.31	10.56	0.78	100	70
8"	7.88	11.75	13.50	0.88	8	15.31	16.71	11.81	19.69	1.02	0.72	6.69	12.06	0.78	100	70

Testing performed on PVC material at 73°F water temperature, non-shock.

DESIGN ADVANTAGES OF STAINLESS STEEL SPRING ASSIST

TVI offers the spring assist design in stainless steel replacing the original counter weight and lever design. The former design required a shaft distance three times longer from the point of exit of the valve body to the fastening knuckle of the lever. The longer shaft was required to clear the obstruction of the valve flanges when opening and closing.

When the pump is shut off the sudden back pressure of the flow media causes the flapper disc to slam against the body seating area. This 'hammerblow' transmits shock loads into the valve shaft which results in the breaking of the stem.

The shorter the shaft distance the less likely the plastic shaft will break in two at the point where it is confined and comes through the packing gland. In the spring assist design, the spring attaches to the valve shaft immediately after clearing the packing cap. Thus, the whipping action is eliminated. This is an adjustable feature; the amount of adjustment depends on the size of the valve.



DATE: _____

NUMBER: _____

ADDITIONAL INFORMATION SHEET

Distributors discount is as follows for all valve products shown on list price sheet

Project Quotes

- Contact your local TVI Representative

Available Options

- Pneumatic and electric actuators for butterfly valves, safety block valves and diaphragm valves supported and non-supported in carbon steel, 304 stainless steel and 316 stainless steel.
- Threaded lug insert for butterfly valves in carbon steel, 304 stainless steel and 316 stainless steel.
- Please consult your local TVI representative for pricing and availability.

Terms & Conditions of Sale

Minimum order \$50.00 net.

Freight allowed on net orders of \$_____.

Payment Terms

- Payment must be received within 45 days of invoice date or penalty charges stamped on each individual invoice will apply.

Returns

- Returns must be approved by factory representative. Valves must be in resalable condition in original cartons. No credit will be extended until valves are inspected at factory. All must be made within six months of invoice date using invoice number as Returned Goods Authorization (RGA) number. TVI's RGA form must be included in carton. Freight must be prepaid. Restocking charge is 25% of invoice amount. Minimum return amount is \$50.00 net.

Note: When purchase order does not indicate end connection, socket is supplied. When elastomer is not indicated, EPDM is supplied.