ASTRAL CORZAN™
INDUSTRIAL PIPING SYSTEMS

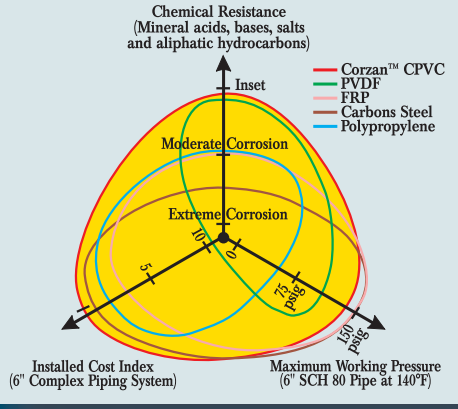
Dimensional Manual Of ASTRAL CORZAN CPVC Fittings, Valves & Flanges



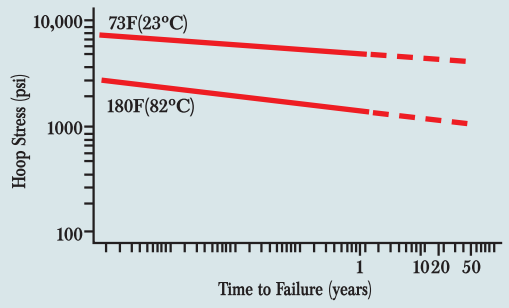

Weights & Dimensions

ASTRAL®
where INNOVATION flows

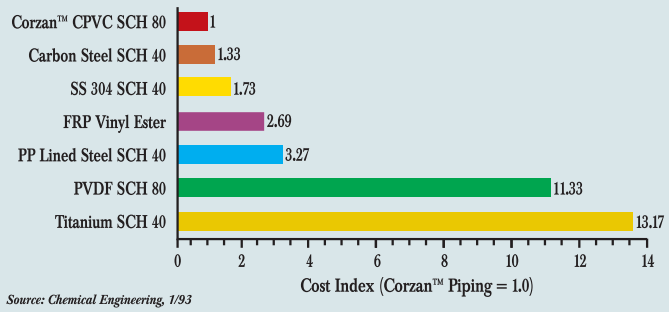
Outstanding Balance of Properties



Long-term Performance of Corzan™ Pipe



Installed Cost: 6" Complex System



Source: Chemical Engineering, 1/93

Maximum Working Pressure of 6" Diameter SCH.80 Piping

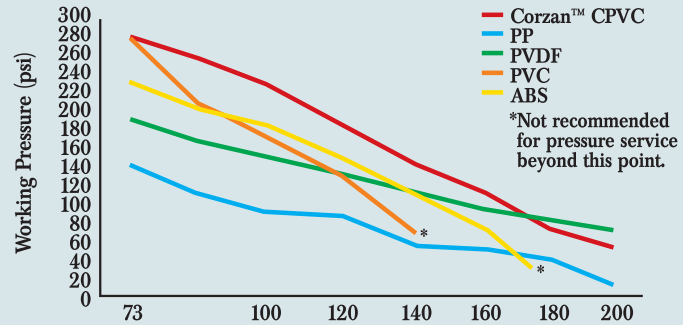


TABLE OF CONTENTS

ASTRAL CORZAN™
INDUSTRIAL PIPING SYSTEMS

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CPVC INDUSTRIAL
PIPING SYSTEMS

What is Corzan™ CPVC?

Chlorinated polyvinyl chloride (CPVC) has become an important engineering thermoplastic due to its relatively low cost, high glass transition temperature, high heat distortion temperature, chemical inertness, and outstanding mechanical, dielectric, and flame and smoke properties.

CPVC was first commercialized by BFGoodrich in the early 1960s and has since proven its value in a variety of industrial applications in which a high use temperature and excellent resistance to corrosive chemicals are desirable. Besides pipe and fittings, many other industrial fluid-handling products are available in Corzan CPVC including pumps, valves, strainers, tower packing, and duct, as well as sheet for fabrication into tanks, ducts, and tank lining.

Conceptually, Corzan CPVC is a PVC homopolymer that has been subjected to a chlorination reaction. Typically, chlorine and PVC react according to a basic free radical mechanism. This can be brought about by various approaches using thermal and/or UV energy for initiation of the reaction. A generalized mechanism for the free radical chlorination of PVC can be schematically represented as follows, where RH denotes PVC:

Initiation: $Cl2 \xrightarrow{\text{Heat}} 2Cl\bullet$

Propagation: $RH + Cl\bullet \xrightarrow{\text{UV Energy}} R\bullet + HCl$

$R\bullet + Cl_2 \longrightarrow RCl + Cl\bullet$

Termination: $R\bullet + Cl\bullet \longrightarrow RCl$

$Cl\bullet + Cl\bullet \longrightarrow Cl_2$

$R\bullet + R\bullet \longrightarrow R2$

CPVC produced in such a manner can be structurally quite varied depending on the chlorination method, conditions, and the amount of chlorine reacted. The chlorine content of base PVC can be increased from 56.7 percent to as high as 74 percent, though typically most commercial CPVC resins have 63 to 69 percent chlorine. As the chlorine content in CPVC is increased, the glass transition temperature (Tg) of the polymer increases significantly. Also, as the molecular weight of base PVC is increased, there is a smaller proportionate increase in the Tg at an equivalent level of chlorine.

Basic Physical Properties

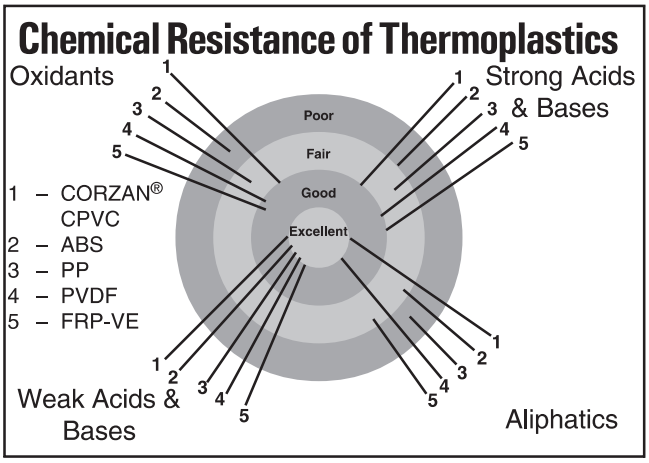
Property	Test	Condition	English Units	SI Units
GENERAL				
Specific Gravity	ASTM D792	73°F/23°C	1.55 g/cm^3	1.55 g/cm^3
Specific Volume		73°F/23°C	.0103 ft^3 /lb	0.645 cm^3 /g
Water Absorption	ASTM D570	73°F/23°C	+0.03%	+0.03%
		212°F/100°C	+0.55%	+0.55%
Rockwell Hardness	ASTM D785	73°F/23°C	119	
Cell Class	ASTM D1784		23447-B	
MECHANICAL				
Izod Impact	ASTM D256	73°F/23°C	1.5 ft lbs/in o.n.	80 J/m o.n.
Tensile Strength	ASTM D638	73°F/23°C	8000 psi	55 N/mm^2
Tensile Modulus	ASTM D638	73°F/23°C	360,000 psi	2500 N/mm^2
Flexural Strength	ASTM D790	73°F/23°C	15,100 psi	104 N/mm^2
Flexural Modulus	ASTM D790	73°F/23°C	415,000 psi	2860 N/mm^2
Compressive Strength	ASTM D695	73°F/23°C	10,100 psi	70 N/mm^2
Compressive Modulus	ASTM D695	73°F/23°C	196,000 psi	1350 N/mm^2
THERMAL				
Coefficient of Thermal Expansion	ASTM D696		3.4x10^{-5} in/in/°F	1.9x10^{-5} m/m/K
Thermal Conductivity	ASTMC177		0.95 BTU in/hr/ft^2 /°F	0.137 W/m/K
Heat Distortion Temperature	ASTM D648		217°F	103°C
*Heat Capacity	DSC	73°F/23°C	0.21 BTU/lb°F	0.90 J/gK
		212°F/100°C	0.26 BTU/lb°F	1.10 J/gK
FLAMMABILITY				
Flammability Rating	UL94	0.062 in/0.157 cm	V-O, 5VB, 5VA	
Flame Spread	ASTM E84		15	
Smoke Developed	ASTM E84		70-125	
Limiting Oxygen Index	ASTM D2863		60%	
ELECTRICAL				
Dielectric Strength	ASTM D147		1250 V/mil	492,000 V/cm
Dielectric Constant	ASTM D150	60 Hz, 30°F/-1°C	3.70	3.70
Power Factor	ASTM D150	1000 Hz	0.007%	0.007%
Volume Resistivity	ASTM D257	73°F/23°C	3.4x10^{15} ohm/cm	3.4x10^{15} ohm/cm

Chemical Resistance

One of the key advantages of Corzan® CPVC is its excellent resistance to a broad range of corrosive environments. By replacing traditional materials with Corzan CPVC, engineers can extend equipment service life and reduce maintenance, while minimizing process life- cycle costs.This technical report is intended to provide engineers and end- users with guidance as to the suitability of Corzan industrial piping systems in corrosive applications.

In general, Corzan CPVC is inert to most mineral acids, bases, salts, and aliphatic hydrocarbons, and compares favor-ably to other non-metals in these chemical environments.

Specific use conditions must also be considered since these will determine the chemical resistance of any thermoplastic piping system.Variables that can affect chemical resistance include chemical concentration, temperature, pressure, external stress, and final product quality. Since the number of possible use conditions is so large, the final decision regarding material suitability often must be based on in- service testing.



The information contained in this report was developed to include conditions that are most often encountered in industry. CPVC samples were immersed in the particular reagent for at least 90 days at 73°F(23°C) and 180°F(82°C). Changes in weight and tensile strength for each sample were reviewed in conjunction with field experience and information gathered from various sources to develop recommendations shown. Note that these recommendations are based on specific use conditions and may not apply to all situations. For this reason,the final decision regarding material suitability must rest with the end- user.

The notes following the chemical resistance chart list specific areas where caution must be used when considering Corzan CPVC. Additional chemical resistance data will become available as testing of Corzan CPVC continues. Consult with your product supplier or for the latest Corzan CPVC chemical resistance information.

N.B. Information presented within this report is based on test data and field experience of CPVC manufactured by Lubrizol Advanced Materials and is not intended to reflect the properties found with other suppliers of CPVC materials.

Noted Caution Areas for CPVC

CPVC is not recommended for use with most polar organic materials including various solvents i.e., chlorinated or aromatic hydrocarbons, esters, or ketones. Resistance of CPVC to certain other fluid mixtures such as fuel oils with moderate aromatic content cannot be determined on basis of immersion testing alone. Actual use data must be obtained.

There are a number of similarities in chemical resistance between PVC and CPVC materials. However, one must exercise caution when comparing the chemical resistance properties of CPVC to those of PVC, which are not always the same.

CPVC test samples exposed while under stress to surfactants, certain oils, or grease have shown signs of environmental stress cracking. Environmental stress cracking is a situation in which the manufactured pipe or fittings are weakened by contact with certain chemicals and propagated by external stresses. External stresses include not only the known pressure stress on a system but also stresses from sources such as expansion and installation.When CPVC is intended for use in handling such chemicals, special consideration should be taken during design and installation to avoid unusual stresses in the piping system,or advance testing of the chemical in simulated use conditions is strongly suggested.

Certain organic solvents which are soluble with water, such as alcohols, may safely be handled below a certain concentration. Many of these limiting concentrations are noted in the chemical resistance table. Solvents which are insoluble in water, such as aromatics, will be absorbed by the piping over time, even when they are present at very low levels in the water. This will lead to a decreased service life expectancy for the system.

The full hydrostatic pressure rating of the pipe may not apply to the entire range of temperature and concentration designated as “recommended.”

Contact your piping supplier or Lubrizol Advanced Materials for consultation and/or the latest chemical resistance information.

Chemical Resistance of Corzan® CPVC

Reagent	Temperature 73°F (23°C)	180°F (82°C)
Acetaldehyde	N	N
Acetic Acid, up to 10%	R	R
Acetic Acid, greater than 10%	C	C
Acetic Acid, Glacial	N	N
Acetic Anhydride	N	N
Acetone, up to 5%	R	R
Acetone, greater than 5%	C	C
Acetone, pure	N	N
Acetyl Nitrile	N	N
Acrylic Acid	N	N
Acrylonitrile	N	N
Adipic Acid, sat'd in water	R	R
Alcohols	C	C
Allyl Alcohol	C	C
Allyl Chloride	N	N
Alum, all varieties	R	R
Aluminum Acetate	R	R
Aluminum Chloride	R	R
Aluminum Fluoride	R	R
Aluminum Hydroxide	R	R
Aluminum Nitrate	R	R
Aluminum Sulfate	R	R
Amines	N	N
Ammonia	N	N
Ammonium Acetate	R	R
Ammonium Benzoate	R	R
Ammonium Bifluoride	R	R
Ammonium Carbonate	R	R
Ammonium Chloride	R	R
Ammonium Citrate	R	R
Ammonium Dichromate	R	R
Ammonium Fluoride	R	R
Ammonium Hydroxide	N	N
Ammonium Metaphosphate	R	R
Ammonium Nitrate	R	R
Ammonium Persulfate	R	–
Ammonium Phosphate	R	C
Ammonium Sulfamate	R	R
Ammonium Sulfate	R	R
Ammonium Sulfide	R	R
Ammonium Thiocyanate	R	R
Ammonium Tartrate	R	R
Amyl Acetate	N	N
Amyl Alcohol	C	C
Amyl Chloride	N	N
Aniline	N	N
Antimony Trichloride	R	R
Aqua Regia	R	N
Aromatic Hydrocarbons	N	N
Arsenic Acid	R	R
Barium Carbonate	R	R
Barium Chloride	R	R
Barium Hydroxide	R	R
Barium Nitrate	R	R
Barium Sulfate	R	R
Barium Sulfide	R	R
Beer	R	R
Beet Sugar Liquors	R	R
Benzaldehyde	N	N
Benzene	N	N
Benzoic Acid, sat'd in water	R	N
Benzyl Alcohol	N	N
Benzyl Chloride	N	N
Bismuth Carbonate	R	R
Black Liquor	R	R
Bleach, household (5% Cl)	R	R
Bleach, industrial (15% Cl)	R	R
Borax	R	R
Boric Acid	R	R
Brine Acid	R	R
Bromine	N	N
Bromobenzene	N	N
Bromotoluene	N	N
Butanol	C	C
Butyl Acetate	N	N
Butyl Carbitol	N	N
Butyl Cellosolve	N	N
Butyric Acid, up to 1%	R	R
Butyric Acid, greater than 1%	C	C
Butyric Acid, pure	N	N
Cadmium Acetate	R	R
Cadmium Chloride	R	R
Cadmium Sulfate	R	R
Calcium Acetate	R	R
Calcium Bisulfide	R	R
Calcium Bisulfite	R	R
Calcium Carbonate	R	R
Calcium Chlorate	R	R
Calcium Chloride	R	R
Calcium Hydroxide	R	R
Calcium Hypochlorite	R	R
Calcium Nitrate	R	R
Calcium Oxide	R	R
Calcium Sulfate	R	R
Cane Sugar Liquors	R	R
Caprolactam	N	N
Caprolactone	N	N
Carbitol	N	N
Carbon Dioxide	R	R
Carbon Disulfide	N	N
Carbon Monoxide	R	R
Carbon Tetrachloride	N	N
Carbonic Acid	R	R
Castor Oil	C	C
Caustic Potash	R	R
Caustic Soda	R	R
Cellosolve, all types	N	N
Chloric Acid	R	R
Chlorinated Solvents	N	N
Chlorinated water, (hypochlorite)	R	R
Chlorine, dry gas	N	N
Chlorine, liquid	N	N
Chlorine, trace in air	R	R
Chlorine, wet gas	N	N
Chlorine dioxide, aqueous, sat'd (0.1%)	R	–
Chlorine water, sat'd (0.3%)	R	R
Chlorobenzene	N	N
Chloroform	N	N
Chromic Acid, 40% (conc.)	R	R
Chromium Nitrate	R	R
Citric Acid	R	R
Citrus Oils	N	N
Coconut Oil	C	C
Copper Acetate	R	R
Copper Carbonate	R	R
Copper Chloride	R	R
Copper Cyanide	R	R
Copper Fluoride	R	R
Copper Nitrate	R	R
Copper Sulfate	R	R
Corn Oil	C	C
Corn Syrup	R	R
Cottonseed Oil	C	C
Creosote	N	N
Cresol	N	N
Crotonaldehyde	N	N
Cumene	N	N
Cupric Fluoride	R	R
Cupric Sulfate	R	R
Cuprous Chloride	R	R
Cyclohexane	N	N
Cyclohexanol	N	N
Cyclohexanone	N	N
Detergents	C	C
Dextrin	R	R
Dextrose	R	R
Dibutyl Phthalate	N	N
Dibutyl Ethyl Phthalate	N	N
Dichlorobenzene	N	N
Dichloroethylene	N	N
Diethylamine	N	N
Diethyl Ether	N	N
Dill Oil	N	N
Dimethylformamide	N	N
Disodium Phosphate	R	R
Distilled Water	R	R
EDTA, Tetrasodium-	R	R
Esters	N	N
Ethanol, up to 5%	R	R
Ethanol, greater than 5%	C	C
Ethers	N	N
Ethyl Acetate	N	N
Ethyl Acrylate	N	N
Ethyl Benzene	N	N
Ethyl Chloride	N	N
Ethyl Ether	N	N
Ethylene Bromide	N	N
Ethylene Chloride	N	N
Ethylene Diamine	N	N
Ethylene Glycol, up to 50%	R	R
Ethylene Glycol, greater than 50%	C	C
Ethylene Oxide	N	N
Ferric Chloride	R	R
Ferric Hydroxide	R	R
Ferric Nitrate	R	R
Ferric Sulfate	R	R
Ferrous Chloride	R	R

Chemical Resistance of Corzan® CPVC

Reagent	Temperature 73°F (23°C)	180°F (82°C)
Ferrous Hydroxide	R	R
Ferrous Nitrate	R	R
Ferrous Sulfate	R	R
Fluorine gas	N	N
Fluosilicic Acid, 30%	R	C
Formaldehyde	N	N
Formic Acid, up to 25%	R	R
Formic Acid, greater than 25%	C	N
Freons	C	C
Fructose	R	R
Gasoline	N	N
Glucose	R	R
Glycerine	R	R
Glycol Ethers	N	N
Green Liquor	R	R
Halocarbon Oils	C	C
Heptane	C	–
Hydrazine	N	N
Hydrochloric Acid	R	R
Hydrochloric Acid, 36% (conc.)	R	C
Hydrofluoric Acid, 3%	R	–
Hydrofluosilicic Acid, 30%	R	C
Hydrogen Peroxide, 30%	R	–
Hydrogen Sulfide, Aqueous	R	R
Hypochlorous Acid	R	R
Isopropanol	C	C
Ketones	N	N
Kraft Liquors	R	R
Lactic Acid 25%	R	R
Lactic Acid, 85% (Full strength)	R	C
Lead Acetate	R	R
Lead Chloride	R	R
Lead Nitrate	R	R
Lead Sulfate	R	R
Lemon Oil	N	N
Limonene	N	N
Linseed Oil	C	C
Lithium Chloride	R	R
Lithium Sulfate	R	R
Lubricating Oil, ASTM 1,2,3	R	–
Magnesium Carbonate	R	R
Magnesium Chloride	R	R
Magnesium Citrate	R	R
Magnesium Fluoride	R	R
Magnesium Hydroxide	R	R
Magnesium Salts, inorganic	R	R
Magnesium Nitrate	R	R
Magnesium Oxide	R	R
Magnesium Sulfate	R	R
Maleic Acid, 50%	R	R
Manganese Sulfate	R	R
Mercuric Chloride	R	R
Mercuric Cyanide	R	R
Mercuric Sulfate	R	R
Mercurous Nitrate	R	R
Mercury	R	R
Methane Sulfonic Acid	R	R
Methanol, up to 10%	R	R
Methanol, greater than 10%	C	C
Methanol, pure	N	N
Methyl Cellosolve	N	N
Methyl Chloride	N	N
Methyl Ethyl Ketone	N	N
Methyl Formate	N	N
Methyl Isobutyl Ketone	N	N
Methyl Methacrylate	N	N
Methylamine	N	N
Methylene Chloride	N	N
Mineral Oil	R	–
Monoethanolamine	N	N
Motor Oil	R	–
Muriatic Acid	R	C
Naphthalene	N	N
Nickel Acetate	R	R
Nickel Chloride	R	R
Nickel Nitrate	R	R
Nickel Sulfate	R	R
Nitric Acid, up to 25%	R	R
Nitric Acid, 25-35%	R	C
Nitric Acid, greater than 35%	R	N
Nitric Acid, 70%	R	N
Nitrobenzene	N	N
1-Octanol	C	N
Oils, edible	C	C
Oils, Sour Crude	N	N
Oleum	N	N
Olive Oil	C	C
Oxalic Acid, Sat'd	R	C
Oxygen	R	R
Ozonized water	R	–
Palm Oil	C	C
Paraffin	R	–
Peanut Oil	C	C
Perchloric Acid, 10%	R	–
Phenylhydrazine	N	N
Phosphoric Acid	R	R
Phosphorus Trichloride	N	N
Picric Acid	N	N
Pine Oil	N	N
Plating Solutions	R	R
Polyethylene Glycol	N	N
Potash	R	R
Potassium Acetate	R	R
Potassium Bicarbonate	R	R
Potassium Bichromate	R	R
Potassium Bisulfate	R	R
Potassium Borate	R	R
Potassium Bromate	R	R
Potassium Bromide	R	R
Potassium Carbonate	R	R
Potassium Chlorate	R	R
Potassium Chloride	R	R
Potassium Chromate	R	R
Potassium Cyanate	R	R
Potassium Cyanide	R	R
Potassium Dichromate	R	R
Potassium Ferricyanide	R	R
Potassium Ferrocyanide	R	R
Potassium Fluoride	R	R
Potassium Hydroxide	R	R
Potassium Hypochlorite	R	R
Potassium Iodide	R	R
Potassium Nitrate	R	R
Potassium Perborate	R	R
Potassium Perchlorate, sat'd	R	R
Potassium Permanganate, sat'd	R	R
Potassium Persulfate, sat'd	R	–
Potassium Phosphate	R	R
Potassium Sulfate	R	R
Potassium Sulfide	R	R
Potassium Sulfite	R	R
Potassium Tripolyphosphate	R	R
Propanol, up to 0.5%	R	R
Propanol, greater than 0.5%	C	C
Propionic Acid, up to 2%	R	R
Propionic Acid, greater than 2%	C	C
Propionic Acid, pure	N	N
Propylene Dichloride	N	N
Propylene Glycol, up to 25%	R	R
Propylene Glycol, greater than 25%	C	C
Propylene Oxide	N	N
Pyridine	N	N
Sea Water	R	R
Silicic Acid	R	–
Silicone Oil	R	–
Silver Chloride	R	R
Silver Cyanide	R	R
Silver Nitrate	R	R
Silver Sulfate	R	R
Soaps	R	R
Sodium Acetate	R	R
Sodium Aluminate	R	R
Sodium Arsenate	R	–
Sodium Benzoate	R	R
Sodium Bicarbonate	R	R
Sodium Bichromate	R	R
Sodium Bisulfate	R	R
Sodium Bisulfite	R	R
Sodium Borate	R	R
Sodium Bromide	R	R
Sodium Carbonate	R	R
Sodium Chlorate	R	R
Sodium Chloride	R	R
Sodium Chlorite	R	R
Sodium Chromate	R	R
Sodium Cyanide	R	R
Sodium Dichromate	R	R
Sodium Ferricyanide	R	R
Sodium Ferrocyanide	R	R
Sodium Fluoride	R	R
Sodium Formate	R	R
Sodium Hydroxide	R	R
Sodium Hypobromite	R	R
Sodium Hypochlorite	R	R
Sodium Iodide	R	R

R-Recommended N-Not recommended C-Caution, further testing suggested–suspect with certain stress levels – Incomplete Data N.B. Given percentages are by weight

Chemical Resistance of Corzan® CPVC

Reagent	Temperature 73°F (23°C)	180°F (82°C)
Sodium Metaphosphate	R	R
Sodium Nitrate	R	R
Sodium Nitrite	R	R
Sodium Perborate	R	R
Sodium Perchlorate	R	R
Sodium Phosphate	R	R
Sodium Silicate	R	R
Sodium Sulfate	R	R
Sodium Sulfide	R	R
Sodium Sulfite	R	R
Sodium Thiosulfate	R	R
Sodium Tripolyphosphate	R	R
Soybean Oil	C	C
Stannic Chloride	R	R
Stannous Chloride	R	R
Stannous Sulfate	R	R
Starch	R	R
Stearic Acid	R	–
Strontium Chloride	R	R
Styrene	N	N
Sugar	R	R
Sulfamic Acid	R	R
Sulfur	R	–
Sulfuric Acid, Fuming	N	N
Sulfuric Acid 98%	R	N
Sulfuric Acid 85%	R	N
Sulfuric Acid 80%	R	R
Sulfuric Acid 50%	R	R
Tall Oil	R	R
Tannic Acid, 30%	R	–
Tartaric Acid	R	–
Terpenes	N	N
Tetrahydrofuran	N	N
Tetrasodiumpyrophosphate	R	R
Texanol	N	N
Thionyl Chloride	N	N
Toluene	N	N
Tributyl Phosphate	N	N
Trichloroethylene	N	N
Trisodium Phosphate	R	R
Turpentine	N	N
Urea	R	R
Urine	R	R
Vegetable Oils	C	C
Vinegar	R	R
Vinyl Acetate	N	N
Water, Deionized	R	R
Water, Demineralized	R	R
Water, Distilled	R	R
Water, Salt	R	R
Water, Swimming Pool	R	R
WD-40	C	C
White Liquor	R	R
Xylene	N	N
Zinc Acetate	R	R
Zinc Carbonate	R	R
Zinc Chloride	R	R
Zinc Nitrate	R	R
Zinc Sulfate	R	R

Design Properties of Pipe

The data in the following tables can be used by piping design engineers to estimate loads, stresses, torques, and other mechanical data.

Definitions and Derivations

t: Minimum wall thickness of the pipe in inches as specified by ASTM F441 – Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80

D: Outside diameter of the pipe in inches as specified by ASTM F441

d: Average inside diameter of the pipe in inches calculated by considering the average wall thickness to be the minimum wall thickness plus half the tolerance allowed by ASTM F441. All the values in the following tables are calculated with the average inside diameter, not the minimum wall thickness.

A_o: Outside surface area of the pipe in square feet per foot:

$$A_o = \frac{\pi D}{12}$$

A_i: Inside surface area of the pipe in square feet per foot:

$$A_i = \frac{\pi d}{12}$$

A_w: Cross-sectional area of the pipe wall in square inches:

$$A_w = \frac{\pi(D^2-d^2)}{4}$$

A_f: Cross-sectional area of flow in pipe in square inches:

$$A_f = \frac{\pi d^2}{4}$$

W: Average weight of pipe in pounds per foot:

$$W = 0.671 A_w$$

W_w: Average weight of water in pipe in pounds per foot:

$$W_w = 0.433 A_f$$

K_A: Radius of gyration about the longitudinal axis of the pipe, in inches:

$$K_A = \sqrt{\frac{D^2-d^2}{8}}$$

I_A: Moment of inertia in ft 2 . lb/ft. Since the moment of inertia is dependent on the total weight of the object, it is necessary to multiply the tabulated values by the length of the pipe in feet in order to obtain the actual moment of inertia:

$$I_A = \frac{WK^2_A}{144}$$

Although they are not included in the following table, radii of gyration about a perpendicular axis bisecting a pipe of length h and about a perpendicular axis at the end of a pipe of length h may be calculated from the following equations. The moments of inertia about those axes may be calculated using the same equation above which was used to calculate the moment of inertia about the longitudinal axis.

K_B: Radius of gyration, in inches, about a perpendicular bisecting axis (where D and d are in inches and h is in feet):

$$K_B = \sqrt{\frac{D^2+d^2+192h^2}{16}}$$

K_E: Radius of gyration, in inches, about a perpendicular axis at the end of the pipe (where D and d are in inches and h is in feet):

$$K_E = \sqrt{\frac{D^2+d^2+768h^2}{16}}$$

Design Properties of Pipe

Schedule 80

Pipe Size (in)	t Minimum Wall Thickness (in)	d Average Inside Diameter (in)	D Outside Diameter (in)	Ao Outside Surface Area (ft^2 /ft)	Ai Inside Surface Area (ft^2 /ft)	Aw Cross Sectional Area of Pipe wall (in^2)	Af Cross Sectional Area of Flow (in^2)	W Average Weight of Pipe (lb/ft)	Ww Average Weight of Water (lb/ft)	KA Axial Radius of Gyration (in)	IA Axial Moment of Inertia (ft^2 lb/ft)
½	0.147	0.528	0.840	0.220	0.138	0.335	0.219	0.225	0.095	0.231	0.028
¾	0.154	0.724	1.050	0.275	0.190	0.454	0.412	0.305	0.178	0.269	0.062
1	0.179	0.935	1.315	0.344	0.245	0.672	0.687	0.451	0.297	0.327	0.147
1¼	0.191	1.256	1.660	0.435	0.329	0.925	1.239	0.621	0.537	0.384	0.336
1½	0.200	1.476	1.900	0.497	0.386	1.124	1.711	0.755	0.741	0.423	0.546
2	0.218	1.913	2.375	0.622	0.501	1.556	2.874	1.045	1.245	0.498	1.214
2½	0.276	2.289	2.875	0.753	0.599	2.377	4.115	1.596	1.782	0.615	2.694
3	0.300	2.864	3.500	0.916	0.750	3.179	6.442	2.134	2.790	0.711	5.456
4	0.337	3.786	4.500	1.178	0.991	4.647	11.258	3.120	4.876	0.860	13.486
6	0.432	5.709	6.625	1.734	1.495	8.873	25.598	5.957	11.088	1.188	56.954
8	0.500	7.565	8.625	2.258	1.981	13.479	44.948	9.049	19.469	1.465	148.879
10	0.593	9.492	10.750	2.814	2.485	20.000	70.763	13.427	30.650	1.784	345.178
12	0.687	11.294	12.750	3.338	2.957	27.495	100.181	18.459	43.392	2.092	669.421

Schedule 40

Pipe Size (in)	t Minimum Wall Thickness (in)	d Average Inside Diameter (in)	D Outside Diameter (in)	Ao Outside Surface Area (ft^2 /ft)	Ai Inside Surface Area (ft^2 /ft)	Aw Cross Sectional Area of Pipe wall (in^2)	Af Cross Sectional Area of Flow (in^2)	W Average Weight of Pipe (lb/ft)	Ww Average Weight of Water (lb/ft)	KA Axial Radius of Gyration (in)	IA Axial Moment of Inertia (ft^2 lb/ft)
½	0.109	0.608	0.840	0.220	0.159	0.264	0.290	0.177	0.126	0.205	0.024
¾	0.113	0.810	1.050	0.275	0.212	0.351	0.515	0.235	0.223	0.236	0.052
1	0.133	1.033	1.315	0.344	0.270	0.520	0.838	0.349	0.363	0.288	0.122
1¼	0.140	1.364	1.660	0.435	0.357	0.703	1.461	0.472	0.633	0.334	0.272
1½	0.145	1.592	1.900	0.497	0.417	0.845	1.991	0.567	0.862	0.367	0.436
2	0.154	2.049	2.375	0.622	0.536	1.133	3.297	0.760	1.428	0.425	0.935
2½	0.203	2.445	2.875	0.753	0.640	1.797	4.695	1.206	2.034	0.535	2.148
3	0.216	3.042	3.500	0.916	0.796	2.353	7.268	1.580	3.148	0.612	4.247
4	0.237	3.998	4.500	1.178	1.047	3.351	12.554	2.249	5.438	0.730	10.188
6	0.280	6.031	6.625	1.734	1.579	5.904	28.567	3.964	12.374	0.969	39.770
8	0.322	7.943	8.625	2.258	2.079	8.875	49.552	5.958	21.463	1.188	102.390
10	0.365	9.976	10.750	2.814	2.612	12.599	78.163	8.459	33.856	1.416	227.416
12	0.406	11.890	12.750	3.338	3.113	16.643	111.033	11.173	48.093	1.628	424.500

General Specification

Product Description

Corzan Industrial Systems are produced from specialty plastic compounds known as post-chlorinated polyvinyl chloride (CPVC) manufactured by The Lubrizol Advanced Materials.

The compounds shall meet cell class 23447B as defined by ASTM D1784 and have a design stress of 2000 psi and a maximum service temperature of 200°F. The compound shall be listed by the National Sanitation Foundation for use with potable water in accordance with NSF Standard 14.The color is light gray.

Pipe: Pipe shall meet or exceed the requirements of ASTM F441 in Schedule 40 and 80 dimensions. Available in size range 15 mm (1/2") -300 mm (12").

Fittings: Fittings shall meet or exceed the requirements of ASTM F437 (Schedule 80 threaded) or ASTM F439 (Schedule 80 socket). Available in size range 15 mm (1/2") -300 mm (12").

Primer/Solvent Cement : All socket type joints shall be made up employing primers and solvent cements that meet or exceed the requirements of ASTM F656 and ASTM F493 respectively. The standard practice for safe handling of primer and cement shall be in accordance with ASTM F402.

Both primer and solvent cement shall conform with the requirements of NSF Standard 14. Only CPVC primer and solvent cement shall be used when making CPVC solvent cement joints.

Markings and Uniformity: Pipe and fittings made from Corzan CPVC compounds shall be clearly marked with the manufacturer's name or trademark, material designation, applicable ASTM Standard, and the NSF seal for potable water use.

Basic Use

Corzan CPVC pipe and fittings are intended for use in both pressure and drain applications in general chemical manufacturing plants, pulp and paper plants, waste water treatment plants, metal treating/ electroplating plants, water purification plants, and food processing plants where excellent resistance to corrosion from a wide range of chemicals, acids, and bases at temperatures up to 200°F is required.

System Design

System design shall be in accordance with standard industry practice for thermoplastic industrial piping systems and shall take into consideration such factors as pressure and flow requirements, friction loss, operating temperatures, support spacing, anchoring, bracing and thrust blocking, temperature correction factors, joining methods, chemical environment, collapse and loading, and thermal expansion and contraction.

Limitations

- Air or compressed gas shall never be used for pressure testing rigid thermoplastic piping systems.
- Temperature correction factors shall be applied when operating temperatures exceed 73°F.
- Only Schedule 80 pipe may be threaded up to and including 4" size, and threads shall be in accordance with ANSI B1.20.1 Taper Pipe Thread.
- Only water soluble oil or water shall be used when threading Corzan pipe.
- Degreasing type solvents shall never be used to clean threads.
- Only Teflon tape shall be used when making plastic threaded connections.
- Flanged systems shall not exceed 150 psi working pressure.
- Threaded joints shall have 50% of the pressure rating of Schedule 80 pipe.
- Corzan CPVC is not recommended for use with most polar organic solvents such as chlorinated or aromatic hydrocarbons, esters, or ketones. Prior testing is recom-mended when required service includes surfactants, oil, or grease. Consult Astral Poly Technik Limited for specific chemical resistance information.

Corzan Piping Systems Dimensions and Pressure Ratings

Corzan Pipe Dimensions and Pressure Ratings*

Schedule 80						Schedule 40**					
Nominal Pipe Size (in)	O.D.	Average I.D.	Minimum Wall	Nominal Wt./Ft.	Maximum Water Pressure (PSI)*	Nominal Pipe Size (in)	O.D.	Average I.D.	Minimum Wall	Nominal Wt./Ft.	Maximum Water Pressure (PSI)*
½	0.840	0.528	0.147	0.225	850	½	0.840	0.608	0.109	0.180	590
¾	1.050	0.724	0.154	0.305	690	¾	1.050	0.810	0.113	0.239	480
1	1.315	0.935	0.179	0.449	630	1	1.315	1.033	0.133	0.352	450
1¼	1.660	1.256	0.191	0.618	520	1¼	1.660	1.364	0.140	0.475	365
1½	1.900	1.476	0.200	0.751	470	1½	1.900	1.592	0.145	0.568	330
2	2.375	1.913	0.218	1.040	400	2	2.375	2.049	0.154	0.761	275
2½	2.875	2.289	0.276	1.584	420	2½	2.875	2.445	0.203	1.201	300
3	3.500	2.864	0.300	2.124	370	3	3.500	3.042	0.216	1.572	260
4	4.500	3.786	0.337	3.105	320	4	4.500	3.998	0.237	2.239	220
6**	6.625	5.709	0.432	5.929	280	6	6.625	6.031	0.280	3.945	180
8**	8.625	7.565	0.500	9.051	250	8	8.625	7.943	0.322	5.958	160
10**	10.750	9.492	0.593	13.429	230	10	10.750	9.976	0.365	8.458	140
12**	12.750	11.294	0.687	18.458	230	12	12.750	11.890	0.406	11.172	130

*Pressure rating applies for water at 73°F. For temperatures greater than 73°F see derating factors. For fluids other than water the full pressure rating may not apply; see chemical resistance table.

**Schedule 40 pipe or Schedule 80 pipe 6" or larger should never be threaded. Schedule 80 pipe operating above 130°F should not be threaded. Use flanged joints, unions, or victaulic couplings where occasional disassembly is necessary.

Pressure Ratings for CPVC Valves

Corzan valves will typically be rated to either 150 psi or 225 psi at 73°F. Derating factors for higher temperatures are shown here. Contact your valve manufacturer for specific information on Corzan valves.

Pressure Ratings for Flanged Systems

Flanged systems of any size should not exceed 150 psi working pressure.

Pressure Ratings for Threaded Systems

Threaded systems are derated to 50% of the pressure rating for the piping at the system operating temperature.

TEMPERATURE DERATING FACTORS

Working Temperature (°F)	Pipe Derating Factor	Valve Derating Factor
73-80	1.00	1.00
90	0.91	0.95
100	0.82	0.90
120	0.65	0.80
140**	0.50	0.70
160**	0.40	0.61
180**	0.25	0.53
200**	0.20	0.45

CORZAN PIPE DIMENSIONS CONVERSION FROM INCHES TO MM SCH 40

Nominal Pipe Size (Inch)	Nominal Pipe Size (MM)	O.D. (Inch)	O.D. (MM)	Average I. D. (Inch)	Average I.D. (MM)	Minimum Wall th. (Inch)	Minimum Wall th. (MM)	Nominal Wt / Ft. (Lb)	Maximum Water Pressure (PSI)	Maximum Water Pressure (KG/CM^2)
1/2	12.70	0.840	21.34	0.608	15.44	0.109	2.77	0.180	590	41.49
3/4	19.06	1.050	26.67	0.810	20.57	0.113	2.87	0.239	480	33.76
1	25.40	1.315	33.40	1.033	26.24	0.133	3.38	0.362	460	31.85
1 ¼	31.75	1.660	42.16	1.364	34.65	0.140	3.56	0.475	365	25.67
1 ½	38.10	1.900	48.26	1.592	40.44	0.145	3.68	0.568	330	23.21
2	50.80	2.375	60.33	2.049	52.04	0.154	3.91	0.761	275	19.34
2 ½	63.50	2.876	73.03	2.445	62.10	0.203	5.16	1.201	300	21.10
3	76.20	3.500	88.90	3.042	77.27	0.216	5.49	1.572	260	18.28
4	101.60	4.500	114.30	3.998	101.55	0.237	6.02	2.239	220	15.47
6	152.40	6.625	168.28	6.031	153.19	0.280	7.11	3.945	180	12.66
8	203.20	8.625	219.08	7.943	201.75	0.322	8.18	6.968	160	11.25
10	254.00	10.750	273.05	9.976	253.39	0.365	9.27	8.458	140	9.85
12	304.80	12.750	323.85	11.890	302.01	0.406	10.31	11.172	130	9.14

CORZAN PIPE DIMENSIONS CONVERSION FROM INCHES TO MM SCH 80

Nominal Pipe Size (Inch)	Nominal Pipe Size (MM)	O.D. (Inch)	O.D. (MM)	Average I. D. (Inch)	Average I.D. (MM)	Minimum Wall th. (Inch)	Minimum Wall th. (MM)	Nominal Wt / Ft. (Lb)	Maximum Water Pressure (PSI)	Maximum Water Pressure (KG/CM^2)
1/2	12.70	0.840	21.34	0.528	13.41	0.147	3.73	0.225	850	59.77
3/4	19.05	1.050	26.67	0.724	18.39	0.154	3.91	0.305	690	48.52
1	25.40	1.315	33.40	0.935	23.75	0.179	4.55	0.449	630	44.30
1 ¼	31.75	1.660	42.16	1.256	31.90	0.191	4.85	0.618	520	36.57
1 ½	38.10	1.900	48.26	1.476	37.49	0.200	5.08	0.751	470	33.05
2	50.80	2.375	60.33	1.913	48.59	0.218	5.54	1.040	400	28.13
2 ½	63.50	2.875	73.03	2.289	58.14	0.276	7.01	1.584	420	29.54
3	76.20	3.500	88.90	2.864	72.75	0.300	7.62	2.124	370	26.02
4	101.60	4.500	114.30	3.786	96.16	0.337	8.56	3.105	320	22.50
6	152.40	6.625	168.28	5.709	145.01	0.432	10.97	5.929	280	19.69
8	203.20	8.625	219.08	7.565	192.15	0.500	12.70	9.051	250	17.58
10	254.00	10.750	273.05	9.492	241.10	0.593	15.06	13.429	230	16.17
12	304.80	12.750	323.85	11.294	286.87	0.687	17.45	18.458	230	16.17

TEMPERATURE DERATING FACTORS

Working Temperature (°F)	73-80	90	100	120	140	160	180	200
Working Temperature (°C)	23-25	32	38	49	60	71	82	93
Pipe Derating Factor	1.00	0.91	0.82	0.65	0.50	0.40	0.25	0.20
Valve Derating Factor	1.00	0.95	0.90	0.80	0.70	0.61	0.53	0.45

Only those products bearing the NSF Mark are certified

Joining Corzan Pipe and Fittings – Solvent Cementing

Cutting

Corzan pipe can be easily cut with a ratchet cutter, wheel-type plastic tubing cutter, power saw, or fine-toothed saw. To ensure the pipe is cut square, a mitre box must be used when cutting with a saw. Cutting the pipe as squarely as possible provides the maximum bonding surface area.

Deburring

Burrs and filings can prevent proper contact between the pipe and fitting and may put undue stress on the pipe and fitting assembly. Burrs and filings must be removed from the outside and inside of the pipe. A chamfering tool or file is suitable for this purpose. A slight bevel should be placed at the end of the pipe to ease entry of the pipe into the socket and minimize the chances of wiping solvent cement from the fitting.

Fitting Preparation

Loose dirt and moisture should be wiped from the fitting socket and pipe end with a clean, dry rag. Moisture can slow the curing, and at this stage of assembly excessive water can reduce the joint strength. The dry fit of the pipe and fitting should be checked. The pipe should enter the fitting socket easily 1/4 to 3/4 of the depth. If the pipe bottoms in the fitting with little interference, extra solvent cement should be used to prepare the joint.

Primer Application

Primer is needed to prepare the bonding area for the addi-tion of the cement and subsequent assembly. It is important that a proper applicator be used. A dauber or paintbrush approximately half the size of the pipe diameter is appropriate. A rag should not be used. Primer is applied to both the out-side of the pipe end and inside of the fitting socket, redipping the applicator as necessary to ensure that the entire surface is tacky.

Solvent Cement Application

Solvent cement must be applied when the pipe surface is tacky, not wet, from primer. Joining surfaces must be penetrated and softened. Cement should be applied with a natural bristle brush half the size of the pipe diameter. A dauber may be used to apply cement on pipe sizes below 2 inches. A heavy, even coat of cement should be applied to the outside of the pipe end, and a medium coat should be applied to the inside of the fitting socket. Pipe sizes greater than 2 inches should receive a second coat of cement on the pipe end.

Assembly

After cement application, the pipe should immediately be inserted into the fitting socket and rotated 1/4 turn. The fitting should be properly aligned for installation at this time. The pipe must meet the bottom of the fitting socket. The assembly should be held in place for 10 to 15 seconds to ensure initial bonding. A bead of cement should be evident around the pipe and fitting juncture. If this bead is not continuous around the socket shoulder, it may indicate that insufficient cement was applied. In this case, the fitting should be discarded and the joint reassembled. Cement in excess of the bead may be wiped off with a rag.

Set and Cure Times

Solvent cement set and cure times are a function of pipe size, temperature, relative humidity, and tightness of fit. Drying time is faster for drier environments, smaller pipe sizes, high temperatures, and tighter fits. The assembly must be allowed to set, without any stress on the joint, for 1 to 5 minutes depending on the factors just discussed. Following the initial set period, the assembly can be handled
carefully avoiding significant stresses to the joint. Refer to the following table for minimum cure times prior to testing. Extra care should be exercised when systems are assembled in extreme temperature conditions. Extra set and cure times should be allowed when the temperature is below 40°F (4°C). When the temperature is above 100°F (38°C), the assembler should ensure that both surfaces to be joined are still wet with cement before joining them.

Joining Corzan Pipe and Fittings – Solvent Cementing (Cont.)

Recommended Set Times

After a joint is assembled using solvent cement, it should not be disturbed for a period of time to allow for proper "setting" of the newly prepared joint. Recommended set times are as follows:

Ambient Temperature	to 1¼"	1½" to 3"	4" to 8"	10" to 12"
60°to 110°F	15 min	30 min	1 hr	2 hr
40°to 60°F	1 hr	2 hr	4 hr	8 hr
0°to 40°F	3 hr	6 hr	12 hr	24 hr

Recommended Cure Times

After a joint is assembled using solvent cement, the cement must be allowed to properly "cure" before the piping system is pressurized. Recommended minimum cure times are shown below. These recommendations should only serve as a guide since atmospheric conditions during installation will affect the curing process.

High humidity and/or colder weather will require longer cure times: typically add 50% to the recommended cure time if surroundings are humid or damp.

CURETIME FOR OPERATING/ TEST PRESSURES TO 180 PSIG

Ambient Temperature	to 1¼"	1½" to 3"	4" to 8"	10" to 12"
60°to 110°F	1 hr	2 hr	6 hr	24 hr
40°to 60°F	2 hr	4 hr	12 hr	40 hr
0°to 40°F	8 hr	16hr	48 hr	8 days

CURE TIME FOR OPERATING/ TEST PRESSURES ABOVE 180 PSIG**

Ambient Temperature	to 1¼"	1½" to 3"	4" to 8"	10" to 12"
60°to 110°F	6 hr	6 hr	24hr	24 hr
40°to 60°F	12 hr	24hr	48 hr	40 hr
0°to 40°F	48 hr	96 hr	8 days	8 days

**DO NOT exceed maximum working pressure of piping for given pipe size and operating temperature

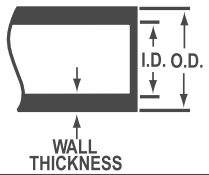
ASTRAL CORZAN™
INDUSTRIAL PIPING SYSTEMS

CPVC SCHEDULE 80 FITTINGS, UNIONS, TANK ADAPTERS, EXPANSION JOINTS & SADDLES

- TEE
- ELL
- CROSS
- COUPLING
- ADAPTER
- BUSHING
- CAP
- PLUG
- CLAMP
- WYE
- UNION

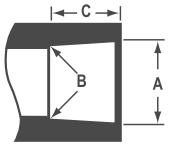
ASTM STANDARD DIMENSIONS

SCHEDULE 80 PIPE DIMENSIONS
ASTM F 441



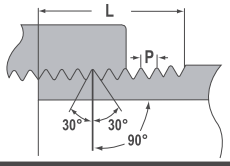
Nominal Pipe Size In.	Mean Outside Diameter In.	O. D. Tolerance In.	Minimum Wall Thickness In.
1/8	0.405	±0.004	0.095
1/4	0.540	±0.004	0.119
3/8	0.675	±0.004	0.126
1/2	0.840	±0.004	0.147
3/4	1.050	±0.004	0.154
1	1.315	±0.005	0.179
1-1/4	1.660	±0.005	0.191
1-1/2	1.900	±0.006	0.200
2	2.375	±0.006	0.218
2-1/2	2.875	±0.007	0.276
3	3.500	±0.008	0.300
4	4.500	±0.009	0.337
5	5.563	±0.010	0.375
6	6.625	±0.011	0.432
8	8.625	±0.015	0.500
10	10.750	±0.015	0.593
12	12.750	±0.015	0.687

SCHEDULE 80 SOCKET DIMENSIONS
ASTM F 439



Nominal Size In.	Diameter			Socket Length Minimum C
	Entrance A	Bottom B	Tolerance A	
1/8	0.417	0.401	±0.004	0.500
1/4	0.552	0.536	±0.004	0.625
3/8	0.687	0.671	±0.004	0.750
1/2	0.848	0.836	±0.004	0.875
3/4	1.058	1.046	±0.004	1.000
1	1.325	1.310	±0.005	1.125
1-1/4	1.670	1.655	±0.005	1.250
1-1/2	1.912	1.894	±0.006	1.375
2	2.387	2.369	±0.006	1.500
2-1/2	2.889	2.868	±0.007	1.750
3	3.516	3.492	±0.008	1.875
4	4.518	4.491	±0.009	2.250
5	5.583	5.553	±0.010	2.625
6	6.647	6.614	±0.011	3.000
8	8.655	8.610	±0.015	4.000
10	10.780	10.735	±0.015	5.000
12	12.780	12.735	±0.015	6.000

AMERICAN NATIONAL STANDARD
TAPER PIPE THREADS (NPT) ANSI
B1 .20.1,ASTM F 1498



Nominal Size In.	Threads Per Inch	Effective Thread Length L	Pitch Of Thread P
1/8	27	0.2639	0.03704
1/4	18	0.4018	0.05556
3/8	18	0.4078	0.05556
1/2	14	0.5337	0.07143
3/4	14	0.5457	0.07143
1	11-1/2	0.6828	0.08696
1-1/4	11-1/2	0.7068	0.08696
1-1/2	11-1/2	0.7235	0.08696
2	11-1/2	0.7565	0.08696
2-1/2	8	1.1375	0.12500
3	8	1.2000	0.12500
4	8	1.3000	0.12500
5	8	1.4063	0.12500
6	8	1.5125	0.12500
8	8	1.7125	0.12500

STANDARD COMPARISONS

SPEARS® IPS-to-Metric transition unions are listed by nominal size. The chart below compares nominal and actual* pipe O.D. for each size according to the designated standard.

JIS K6741 (mm)		DIN 8062 (mm)		ASTM F 441 (in.)		NPT—ANSI B1.20.1** Tapered Thread		BSP—BS21,DIN 2999,ISO 7/1 Thread	
Nominal	Actual*	O.D.	Actual*	Nominal	Actual*	Designation	Threads/in.	Designation	Threads/ 25.4mm
16	22	20	20	1/2	.840	1/2	14	1/2	14
20	26	25	25	3/4	1.050	3/4	14	3/4	14
25	32	32	32	1	1.315	1	11.5	1	11
30	38	40	40	1-1/4	1.660	1-1/4	11.5	1-1/4	11
40	48	50	50	1-1/2	1.900	1-1/2	11.5	1-1/2	11
50	60	63	63	2	2.375	2	11.5	2	11
75	89	90	90	3	3.500	3	8	3	11
100	114	110	110	4	4.500	4	8	4	11

*Specified dimension, certain tolerances apply **NPT and BSP have different thread angles and not compatible.

CPVC SCHEDULE 80 FITTINGS, UNIONS, TANK ADAPTERS, EXPANSION JOINTS & SADDLES

Injection Molded Dimensions Referencesces:

G = (LAYING LENGTH) intersection of center lines to bottom of socket/thread; 90° elbows, tees, crosses; ± 1/32 inch.
H = intersection of center lines to face of fitting; 90° elbow tees, crosses; ± 1/32 inch.
J = intersection of center lines to bottom of socket/thread; 45° elbows; ± 1/32 inch

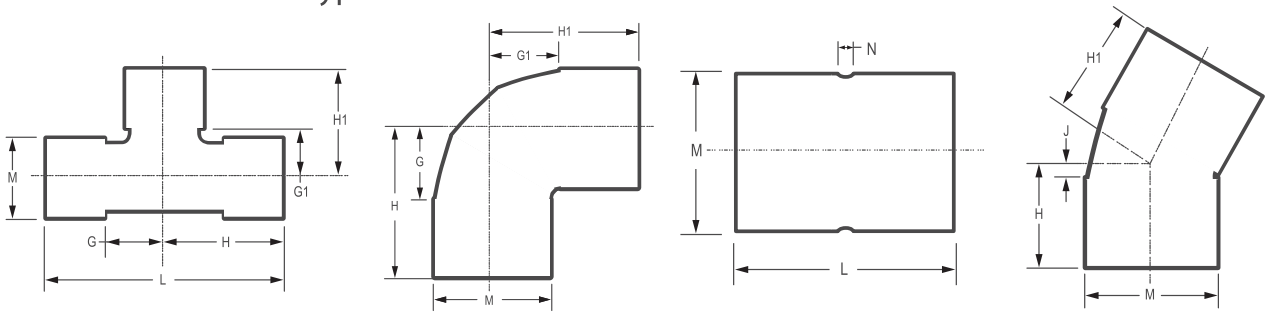
L = overal lenght of fittings; ± 1/16 inch.
H = outside diameter of socket/thread hub; ± 1/16 inch.
N = socket bottom to socket bottom; couplings; ± 1/16 inch
W = height of cap; ± 1/16 inch.

Fabricated Dimension References:

G = (LAYING LENGTH) intersection of center lines to bottom of socket/thread; 90° elbows, tees, crosses ± 1/4 inch; 14" & larger ± 1/2 inch.
H = intersection of center lines to face of fitting; 90° elbows ± 1/4 inch, 14" & larger ± 3/4 inch; wyes ± 1/2 inch; tees, crosses ± 1/4 inch; 14" & larger ± 1/2 inch.
J = intersection of center lines to bottom of socket/thread; 45° elbows; ± 1/4 inch; 14" & larger ± 1/2 inch.

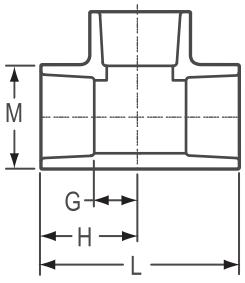
L = overall length of fittings; ± 1/2 inch; 14" & larger ± 1 inch; wyes ± 1 inch.
M = outside diameter of socket/thread hub; ± 1/4 inch.
N = socket bottom to socket bottom; couplings; ±1/2
W = height of cap; ± 1/4 inch.

Typical Fabricated Dimension References



TEE

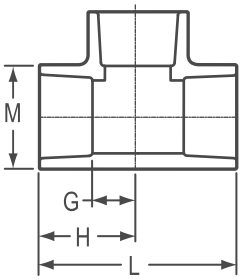
Soc x Soc x Soc



Part Number	Size	G	H	L	M	Approx. Wt. (Lbs.)
CPVC						CPVC
801-005C	1/2	9/16	1-1/2	2-15/16	1-3/16	.11
801-007C	3/4	11/16	1-11/16	3-3/8	1-13/32	.17
801-010C	1	27/32	2	40	1-11/16	.30
801-012C	1-1/4	7/8	2-1/8	4-14	2-3/32	.43
801-015C	1-1/2	1-5/32	2-9/16	5-1/8	2-5/16	.57
801-020C	2	1-7/16	2-15/16	5-7/8	2-7/8	.81
---	2-1/2	1-3/4	3-1/2	7	3-15/32	---
801-025C	2-1/2	1-9/16	3-3/8	6-23/32	3-5/8	1.71
801-030C	3	2-1/16	3-31/32	7-15/16	4-7/32	2.83
801-040C	4	2-5/8	4-7/8	9-3/4	5-1/4	4.15

TEE

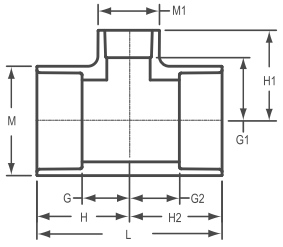
Soc x Soc x Soc (continued)



Part Number	Size	G	H	L	M	Approx. Wt. (Lbs.)
CPVC						CPVC
801-060C	6	3-13/16	6-13/16	13-5/8	7-5/8	12.57
801-080C	8	4-13/16	8-13/16	17-5/8	9-11/16	21.24
801-080CF	8	7-5/8	11-7/8	23-3/4	9-5/8	30.91
801-100C	10	5-3/4	10-13/16	21-5/8	1-19/32	40.50
801-100CF	10	9	14-1/4	28-1/2	11-7/8	51.41
801-120C	12	6-15/16	12-15/16	25-7/8	14-1/4	62.00
801-120CF	12	11-1/4	17-1/2	35	14-1/8	83.37

REDUCING TEE

Soc x Soc x Soc

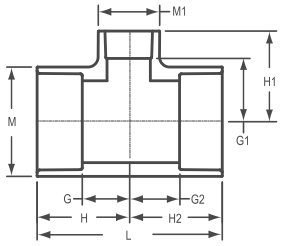


Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	Approx. Wt. (Lbs.)
CPVC											CPVC
801-101C	3/4x3/4x1/2	19/32	23/32	19/32	1-19/32	1-19/32	1-19/32	3-3/16	1-13/32	1-3/16	.15
801-130C	1x1x1/2	19/32	7/8	19/32	1-23/32	1-3/4	1-23/32	3-7/16	1-3/4	1-3/16	.21
801-131C	1x1x3/4	23/32	27/32	23/32	1-27/32	1-27/32	1-27/32	3-11/16	1-11/16	1-3/8	.24
---	1-1/4x1x3/4	11/16	1-1/16	5/8	1-15/16	2-1/16	1-7/8	3-13/16	2-1/8	1-7/16	---
801-158C	1-1/4x1x1	13/32	15/16	13/32	2-1/8	1-31/32	1-15/16	4	2-1/16	1-11/16	.34
801-159C	1-1/4x1x1-1/4	15/16	1-1/32	7/8	2-3/16	2-5/32	2-1/8	4-5/16	2-1/16	2-1/16	.41
801-166C[1]	1-1/4x1-1/4x1/2	7/8	1-13/32	7/8	2-3/8	2-3/8	2-1/8	4-1/4	2-1/8	1-3/4	.43

1: Outlet sized with bushing

REDUCING TEE

Soc x Soc x Soc (continued)

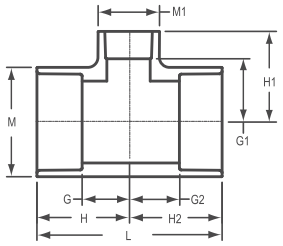


Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	Approx. Wt. (Lbs.)
CPVC											CPVC
801-167C[1]	1-1/4x1-1/4x3/4	11/16	1	11/16	1-15/16	2	1-15/16	3-7/8	2-3/32	1-13/32	.30
801-168C	1-1/4x1-1/4x1	7/8	25/32	7/8	2-1/8	1-29/32	2-1/8	4-1/4	2-1/8	1-3/4	.37
801-202C	1-1/2x1-1/4x1	7/8	1-7/32	7/8	2-1/4	2-11/32	2-1/4	4-1/2	2-7/16	1-13/16	.42
801-209C	1-1/2x1-1/2x1/2	9/16	1-1/4	9/16	2	2-1/8	2	3-15/16	2-5/16	1-1/8	.36
---	1-1/2x1-1/2x1/2	11/16	1-7/16	11/16	2-1/16	2-5/16	2-1/16	4-1/8	2-5/16	1-3/8	---
801-210C	1-1/2x1-1/2x3/4	11/16	1-1/32	116/16	2-1/16	2-1/32	2-1/16	4-1/8	2-5/16	1-3/8	.38
801-211C	1-1/2x1-1/2x1	27/32	1-3/16	27/32	2-1/4	2-5/16	2-1/4	4-1/2	2-11/32	1-23/32	.49
801-212C	1-1/2x1-1/2x1-1/4	1-3/16	1-3/16	1-3/16	2-9/16	2-7/16	2-9/16	5-1/8	2-3/8	2-1/8	.57
801-247C	2x2x1/2	9/16	1-13/32	9/16	2-3/32	2-9/32	2-3/32	4-3/16	2-7/8	1-5/32	.45
801-248C	2x2x3/4	11/16	1-7/16	11/16	2-3/16	2-7/16	2-3/16	4-3/8	2-7/8	1-3/8	.52
801-249C	2x2x1	27/32	1-7/16	27/32	2-11/32	2-15/16	2-11/32	4-23/32	2-7/8	1-3/4	.57
801-251C	2x2x1-1/2	1-3/16	1-7/16	1-3/16	2-11/32	2-13/16	2-11/16	5-3/8	2-7/8	2-3/8	.84
801-287C	2-1/2x2-1/2x1/2	19/32	1-23/32	29/32	2-11/32	2-13/32	2-11/32	4-11/16	3-7/16	1-1/8	.78
801-288C	2-1/2x2-1/2x3/4	7/8	1-3/4	7/8	2-7/16	2-7/8	2-7/16	4-7/8	3-1/2	1-3/8	.83
801-289C	2-1/2x2-1/2x1	13/16	1-13/16	13/16	2-5/8	2-15/16	2-5/8	5-1/4	3-1/2	1-3/4	1.04
801-290C	2-1/2x2-1/2x1-1/4	1-1/16	1-3/4	1-1/16	2-13/16	3	2-13/16	5-5/8	3-1/2	2-3/32	1.12
801-291C	2-1/2x2-1/2x1-1/2	1-5/32	1-3/4	1-5/32	2-15/16	3-1/8	2-15/16	5-7/8	3-1/2	2-3/8	1.24
801-292C	2-1/2x2-1/2x2	1-13/32	1-23/32	1-13/32	3-5/32	3-7/32	3-5/32	6-5/16	3-7/16	2-7/8	1.35
801-333C[1]	3x3x1/2	1-7/16	2-7/8	1-7/16	3-5/16	3-3/4	3-5/16	6-5/8	4-3/16	2-7/8	2.07
801-334C[1]	3x3x3/4	1-7/16	2-11/16	1-7/16	3-5/16	3-11/16	3-5/16	6-5/8	4-3/16	2-7/8	2.05
801-335C	3x3x1	7/8	1-31/32	7/8	2-3/4	3-3/32	2-3/4	5-1/2	4-3/16	1-23/32	1.27
801-336C[1]	3x3x1-1/4	1-5/8	1-15/16	1-5/8	3-5/16	3-5/8	3-5/16	6-5/8	4-3/16	2-7/8	1.97
801-337C	3x3x1-1/2	1-3/16	2-1/16	1-3/16	3-1/16	3-15/32	3-1/16	6-3/32	4-5/32	2-3/8	1.45
801-338C	3x3x2	1-1/2	1-27/32	1-1/2	3-13/32	3-3/8	3-13/32	6-3/4	4-3/16	2-31/32	1.69
801-339C	3x3x2-1/2	1-23/32	2-1/16	1-23/32	3-19/32	3-13/16	3-19/32	7-3/16	4-1/8	3-15/32	2.13
801-415C	4x4x1/2	1-7/16	3-1/2	1-7/16	3-11/16	4-3/8	3-11/16	7-3/8	5-1/4	2-7/8	2.88
801-417C[1]	4x4x1	1-15/32	3-9/32	1-15/32	3-11/16	4-3/8	3-11/16	7-3/8	5-7/32	2-7/8	2.87
801-419C	4x4x1-1/2	1-3/16	3-1/4	1-3/16	3-7/16	4-5/32	3-7/16	6-3/4	5-5/16	2-3/8	2.13
801-420C	4x4x2	1-13/32	2-7/16	1-13/32	3-11/16	3-15/16	3-11/16	7-3/8	5-1/4	2-7/8	2.42
801-421C[1]	4x4x2-1/2	2-1/16	2-11/16	2-1/16	4-5/16	4-3/4	4-5/16	8-5/8	5-1/4	4-1/8	3.68
801-422C	4x4x3	2-1/16	2-21/32	2-3/32	4-11/32	4-15/32	4-11/32	8-11/16	5-7/32	4-3/16	3.22

1: Outlet sized with bushing

REDUCING TEE

Soc x Soc x Soc (continued)

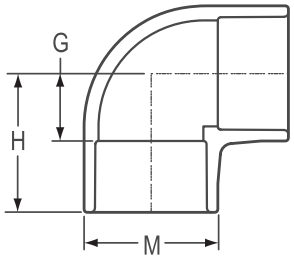


Part Number CPVC	Size	G	G1	G2	H	H1	H2	L	M	M1	Approx. Wt. (Lbs.) CPVC
801-525C	6x6x1	7/8	3-3/4	7/8	3-7/8	4-7/8	3-7/8	7-3/4	7-5/8	1-3/4	4.44
801-526C	6x6x1-1/4	2-11/16	5-9/16	2-11/16	5-9/16	6-13/16	5-9/16	11-1/8	7-1/2	5-1/4	9.24
801-527C[1]	6x6x1-1/2	2-1/16	4-5/8	2-1/16	5-1/16	6	5-1/16	10-1/8	7-9/16	4-1/8	7.16
---	6x6x2	2-1/16	4-5/8	2-1/16	5-1/16	6-1/8	5-1/16	10-5/32	7-9/16	4-7/32	---
801-528C[1]	6x6x2	2-19/32	4-7/8	2-19/32	5-19/32	6-3/8	5-19/32	11-3/16	7-1/2	5-1/4	9.43
801-529C[1]	6x6x2-1/2	2-1/16	3-13/16	2-1/16	5-1/16	5-7/8	5-1/16	10-1/8	7-9/16	4-1/4	8.99
---	6x6x3	2-1/16	3-3/4	2-1/16	5-1/16	5-5/8	5-1/16	10-5/32	7-9/16	4-7/32	---
801-530C[1]	6x6x3	2-5/8	4-3/4	2-5/8	5-5/8	6-1/2	5-5/8	11-1/4	7-9/16	5-1/4	9.16
801-530CF	6x6x3	4-3/4	5-5/8	4-3/4	8	7-7/8	8	16	7-1/2	4-1/8	11.74
801-532C	6x6x4	2 19/32	3 3/4	2 19/32	5 19/32	5 15/16	5 19/32	11 3/16	7 1/2	5 1/4	8.30
801-575C[1]	8x8x1	3-25/32	7-25/32	3-25/32	7-25/32	8-13/16	7-25/32	15-9/16	9-5/8	7-1/2	18.76
801-578C[1]	8x8x2	3-13/16	6-5/8	3-13/16	7-13/16	8-1/8	7-13/16	15-5/8	9-11/16	7-9/16	18.19
801-579CF	8x8x2-1/2	3-1/2	4-3/4	3-1/2	7-3/4	6-1/2	7-3/4	15-1/2	9-5/8	3-9/16	16.63
801-580C[1]	8x8x3	3-23/32	6-1/2	3-23/32	7-3/4	8-3/8	7-3/4	15-1/2	9-11/16	7-1/2	18.44
801-580CF	8x8x3	3-1/2	4-7/8	3-1/2	7-3/4	6-3/4	7-3/4	15-1/2	9-5/8	4-1/4	20.04
801-582C[1]	8x8x4	4-3/4	6-9/16	4-3/4	7-13/16	8-13/16	7-13/16	15-5/8	9-11/16	7-9/16	18.60
801-585C	8x8x6	3-3/4	4-13/16	3-3/4	7-13/16	7-7/8	7-13/16	15-5/8	9-23/32	7-9/16	15.64
801-621CF	10x10x2	3-5/8	5-13/16	3-5/8	8-7/8	7-5/16	8-7/8	17-3/4	11-15/16	2-15/16	27.33
801-622CF	10x10x2-1/2	3-3/4	5-3/4	3-3/4	9	7-3/4	9	18	11-15/16	3-1/2	22.50
801-623C[1]	10x10x3	3-7/8	9	3-7/8	9-3/8	9-1/2	9-3/8	18-3/4	12	7-1/2	28.69
801-623CF	10x10x3	4-1/4	5-7/8	4-1/4	9-1/2	7-3/4	9-1/2	19	11-15/16	4-1/4	24.27
801-624C	10x10x4	3-7/8	7-3/16	3-7/8	9-3/8	9-1/2	9-3/8	18-3/4	12-1/16	7-9/16	28.54
801-626C	10x10x6	3-7/8	5-27/32	3-7/8	9-3/8	8-27/32	9-3/8	18-3/4	12-1/16	7-9/16	25.50
801-626CF	10x10x6	7-1/4	9	7-1/4	12-1/2	12-1/4	12-1/2	25	11-15/16	7-1/2	38.15
801-628C[1]	10x10x8	5-15/16	7-3/4	5-15/16	11-7/16	11-3/4	11-7/16	22-7/8	12-1/16	12-1/16	48.52
801-661CF	12x12x2	3-5/8	6-3/4	3-5/8	9-7/8	8-1/4	9-7/8	19-3/4	14-1/8	2-15/16	32.33
801-663CF	12x12x3	4-5/16	7	4-7/32	10-9/16	8-15/16	10-19/32	21-3/16	14-1/4	4-1/4	34.63
801-664C	12x12x4	4-11/32	10-1/8	4-11/32	10-15/16	12-3/8	10-15/16	21-7/8	14-1/4	9-23/32	38.17
801-664CF	12x12x4	5-3/8	6-3/4	5-3/8	11-5/8	9	11-5/8	23-1/4	14-1/8	5-1/4	38.17
801-666CF	12x12x6	7-1/2	9-3/4	7-1/2	13-3/4	13	13-3/4	27-1/2	14-1/8	7-1/2	55.70
801-668C	12x12x8	4-27/32	7-1/2	4-27/32	11-13/32	11-1/8	11-13/32	22-13/16	14-1/4	9-3/4	42.00
801-668CF	12x12x8	8-3/4	11	8-3/4	15	15-1/4	15	30	14-1/4	9-5/8	66.12
801-670CF	12x12x10	9-5/8	10-1/2	9-5/8	15-7/8	15-3/4	15-7/8	31-3/4	14-1/8	11-15/16	70.97

1: Outlet sized with bushing

90° ELL

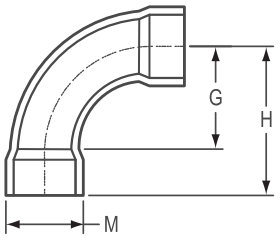
Soc x Soc



Part Number	Size	G	H	M	Approx. Wt. (Lbs.)
CPVC					CPVC
806-005C	1/2	9/16	1-15/32	1-3/16	.09
806-007C	3/4	11/16	1-11/16	1-7/16	.13
806-010C	1	13/16	1-31/32	1-23/32	.20
806-012C	1-1/4	1-1/32	2-5/16	1-31/32	.35
806-015C	1-1/2	1-3/32	2-15/32	2-11/32	.40
806-020C	2	1-7/16	2-15/16	2-7/8	.66
806-025C	2-1/2	1-7/16	3-11/32	3-7/16	1.17
806-030C	3	2-5/32	4-1/32	4-1/8	1.81
806-040C	4	2-5/8	4-7/8	5-1/4	3.49
---	4-1/2	7-1/8	9-11/16	5-3/8	---
806-050C	5	3	5	6-3/8	4.73
---	5	5-15/16	8-15/16	6-5/16	---
---	6	3-13/16	6-13/16	7-9/16	---
806-060C	6	3-3/4	6-3/4	7-19/32	7.48
806-080C	8	4-13/16	8-27/32	9-23/32	15.96
806-080CF	8	8-1/2	12-3/4	9-5/8	22.53
806-100C	10	5-25/32	11-11/32	12-1/16	28.74
---	10	10	15-1/4	11-15/16	---
806-100CF	10	12	17-1/4	11-15/16	40.28
806-120C	12	6-7/8	13-7/16	14-5/16	47.93
---	12	10-7/8	17-1/8	14-1/8	---
806-120CF	12	13	19-1/4	14-1/8	63.96

90° LONG SWEEP ELL

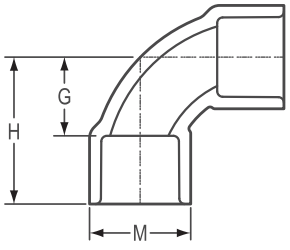
Soc x Soc



Part Number	Size	G	H	M	Approx. Wt. (Lbs.)
CPVC					CPVC
806-005LSCF	1/2	2	2-7/8	1-1/8	.13
806-007LSCF	3/4	2-7/16	3-7/16	1-7/16	.24
806-010LSCF	1	2-3/4	4	1-3/4	.37
806-012LSCF	1-1/4	3-5/8	4-7/8	2-1/16	.56
806-015LSCF	1-1/2	4-1/4	5-1/2	2-5/16	.68
806-020LSCF	2	4-3/4	6-5/16	2-13/16	1.07
806-025LSCF	2-1/2	5-3/4	7-3/4	3-7/16	1.70
806-030LSCF	3	7	9	4-1/8	2.69
806-040LSCF	4	9	11-1/4	5-1/8	4.85
---	6	13-9/16	16-13/16	7-1/2	---
806-060LSCF	6	13	16-1/4	7-1/2	12.84
806-080LSCF	8	23-1/2	27-34	9-5/8	33.18

90° SWEEP ELL

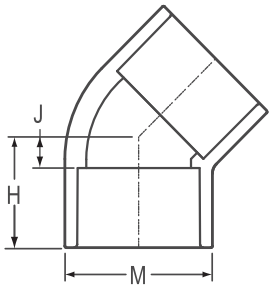
Soc x Soc



Part Number	Size	G	H	M	Approx. Wt. (Lbs.)
CPVC					CPVC
806-005SC	1/2	27/32	1-23/32	1-3/16	.08
806-007SC	3/4	1-1/32	2-1/32	1-13/32	.12
806-010SC	1	1-5/16	2-7/16	1-23/32	.20
806-012SC	1-1/4	1-9/16	2-13/16	2-3/32	.31
806-015SC	1-1/2	1-3/4	3-1/8	2-11/32	.40
806-020SC	2	2-5/16	3-13/16	2-7/8	.68

45° ELL

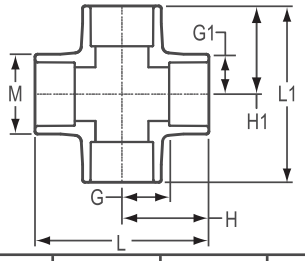
Soc x Soc



Part Number	Size	H	J	M	Approx. Wt. (Lbs.)
CPVC					CPVC
817-005C	1/2	1-3/16	5/16	1-3/16	.07
817-007C	3/4	1-11/32	11/32	1-13/32	.10
817-010C	1	1-7/16	11/32	1-23/32	.16
817-012C	1-1/4	1-11/16	13/32	2-3/32	.22
817-015C	1-1/2	1-27/32	7/16	2-3/8	.32
817-020C	2	2-5/32	21/32	2-7/8	.47
817-025C	2-1/2	2-17/32	25/32	3-1/2	.89
817-030C	3	2-27/32	31/32	4-1/8	1.22
817-040C	4	3-3/8	1-3/32	5-1/4	2.31
---	4-1/2	4-1/2	2	5-5/8	---
817-050C	5	4-15/16	2-5/16	6-3/8	3.51
817-050CF	5	4-1/2	1-1/2	6-5/16	4.25
817-060C	6	4-7/8	1-7/8	7-9/16	5.62
817-080C	8	6	2	9-5/8	10.70
817-100C	10	8-3/16	2-11/16	12	21.29
817-100CF	10	8-1/2	3-1/4	11-15/16	23.50
817-120C	12	10-3/8	4-1/8	14-1/8	35.49

CROSS

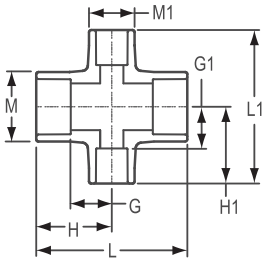
Soc x Soc x Soc x Soc



Part Number	Size	G	G1	H	H1	L	L1	M	Approx. Wt. (Lbs.)
CPVC									CPVC
820-005C	1/2	9/16	9/16	1-15/32	1-15/32	2-15/16	2-15/16	1-3/16	.13
820-007C	3/4	5/8	5/8	1-5/8	1-5/8	3-9/32	3-9/32	1-13/32	.21
820-010C	1	1	1	2-3/16	2-3/16	4-7/32	4-7/32	1-23/32	.46
820-012C	1-1/4	1-3/32	1-3/32	2-3/8	2-3/8	4-3/4	4-3/4	2-3/32	.65
820-015C	1-1/2	1-1/4	1-7/32	2-21/32	2-5/8	5-9/32	5-1/4	2-3/8	.86
820-020C	2	1-17/32	1-17/32	3	3	6	6	2-31/32	1.43
820-025C	2-1/2	1-3/4	1-3/4	3-7/16	3-7/16	6-7/8	6-7/8	3-7/16	2.11
820-030C	3	2-3/32	2-3/32	3-31/32	3-31/32	7-15/16	7-15/16	4-5/32	3.10
820-040C	4	2-5/8	2-5/8	4-7/8	4-7/8	9-3/4	9-3/4	5-1/4	5.50
820-060CF	6	6-1/4	6-1/4	9-1/2	9-1/2	19	19	7-1/2	19.09
820-080CF	8	7-5/8	7-5/8	11-7/8	11-7/8	23-3/4	23-3/4	9-5/8	40.50
820-100CF	10	9	9	14-1/4	14-1/4	28-1/2	28-1/2	11-15/16	67.20
820-120CF	12	11-1/4	11-1/4	17-1/2	17-1/2	35	35	14-1/8	107.80

REDUCING CROSS

Soc x Soc x Soc x Soc

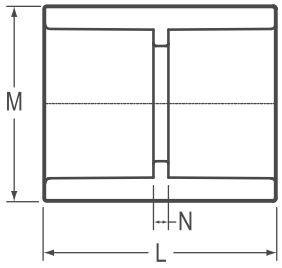


Part Number	Size	G	G1	H	H1	L	L1	M	M1	Approx. Wt. (Lbs.)
CPVC										CPVC
820-130C[1]	1x1x1/2x1/2	1	1-7/16	2-1/8	2-3/8	4-7/32	4-3/4	1-23/32	1-23/32	.59
820-166C[1]	1-1/4x1-1/4x1/2x1/2	1-3/32	1-3/32	2-3/8	2-11/16	4-3/4	5-3/16	3-3/32	3-3/32	.84
820-167C	1-1/4x1-1/4x3/4x3/4	1-1/16	23/32	2-1/16	1-31/32	4-3/32	3-31/32	2-1/16	1-13/32	.35
820-209C[1]	1-1/2x1-1/2x1/2x1/2	1-7/32	1-7/32	2-21/32	2-31/32	5-1/4	5-15/16	2-3/8	2-3/8	1.21
820-211C[1]	1-1/2x1-1/2x1x1	1-3/4	1-3/4	2-5/8	3	5-5/16	5-7/8	1-3/8	1-3/8	1.16
---	2x2x1-1/2x1-1/2	1-1/2	2	3	3-3/8	6	6-3/4	2-7/8	2-7/8	---
820-291C[1]	2-1/2x2-1/2x1-1/2x1-1/2	1-11/16	2-15/32	3-7/16	3-27/32	6-7/8	7-23/32	3-9/16	3-9/16	2.97
820-336C[1]	3x3x1-1/4x1-1/4	2-3/32	3-1/8	3-31/32	4-3/8	7-29/32	8-3/4	4-3/16	4-3/16	4.46
820-420CF	4x4x2x2	3-7/8	4-5/16	6-1/8	6-1/16	12-1/4	12-1/8	5-3/16	2-11/16	5.79
820-422C[1]	4x4x3x3	2-5/8	3-7/16	4-7/8	5-5/16	9-3/4	10-5/8	5-1/4	5-1/4	7-21
820-528CF	6x6x2x2	3-3/4	3-3/4	7	5-1/4	14	10-1/2	7-1/2	2-15/16	7.80
820-530CF	6x6x3x3	4-3/4	5-5/8	8	7-7/8	16	15-3/4	7-1/2	4-1/8	13.30
820-532CF	6x6x4x4	5-1/4	6-5/8	8-1/2	8-7/8	17	17-3/4	7-1/2	5-3/16	15.93
820-578CF	8x8x2x2	3-1/4	4-3/4	7-1/2	6-1/4	15	12-1/2	9-5/8	2-15/16	15.90
820-580CF	8x8x3x3	3-1/2	4-7/8	7-3/4	6-3/4	15-1/2	13-1/2	9-5/8	4-1/4	13.77
820-582CF	8x8x4x4	5-3/4	8	10	10-1/4	20	20-1/2	9-5/8	5-1/4	24.71
820-585CF	8x8x6x6	6-3/4	8	11	11-1/4	22	22-1/2	9-5/8	7-1/2	30.75
820-621CF	10x10x2x2	3-5/8	5-13/16	8-7/8	7-5/16	17-3/4	14-5/8	11-15/16	2-15/16	27.78
---	10x10x2-1/2x2-1/2	3-3/4	5-3/4	9	7-3/4	18	15-1/2	11-15/16	3-1/2	---
820-623CF	10x10x3x3	4-1/4	5-7/8	9-1/2	7-3/4	19	15-1/8	11-15/16	4-1/4	30.16
820-624CF	10x10x4x4	4-3/4	5-3/4	10	8	20	16	11-15/16	5-1/4	28.17
820-626CF	10x10x6x6	7-1/4	9	12-1/2	12-1/4	25	24-1/2	11-15/16	7-1/2	38.61
820-628CF	10x10x8x8	8-1/4	9-3/4	13-1/2	14	27	28	12	9-5/8	59.10
820-661CF	12x12x2x2	5-5/8	8-1/2	11-7/8	10-1/4	23-3/4	20-1/2	14-1/8	2-7/8	44.02
820-663CF	12x12x3x3	6-1/8	8-13/16	12-3/8	11-1/16	24-3/4	22-1/8	14-1/8	4-1/8	45.28
820-664CF	12x12x4x4	5-3/8	6-3/4	11-5/8	9	23-1/4	18	14-1/8	5-1/4	39.39
820-666CF	12x12x6x6	7-1/2	9-3/4	13-3/4	13	27-1/2	26	14-1/8	7-1/2	61.56
820-668CF	12x12x8x8	8-3/4	11	15	15-1/4	30	30-1/2	14-1/4	9-5/8	73.35
820-670CF	12x12x10x10	9-5/8	10-1/2	15-7/8	15-3/4	31-3/4	31-1/2	14-1/8	12	78.03

[1] Outlet sized with bushing

COUPLING

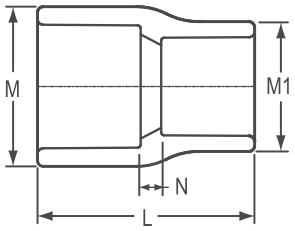
Soc x Soc



Part Number	Size	L	M	N	Approx. Wt. (Lbs.)
CPVC					CPVC
829-005C	1/2	1-7/8	1-3/16	1/8	.07
829-007C	3/4	2-1/8	1-13/32	1/8	.10
829-010C	1	2-3/8	1-23/32	1/8	.16
829-012C	1-1/4	2-23/32	2-7/32	7/32	.24
829-015C	1-1/2	2-7/8	2-11/32	3/16	.32
829-020C	2	3-1/8	2-7/8	1/16	.33
829-025C	2-1/2	3-11/16	3-15/32	1/4	.58
829-030C	3	4	4-3/16	3/16	.90
829-040C	4	4-3/4	5-5/16	1/4	1.36
829-060C	6	6-1/4	7-11/16	1/4	3.77
829-080C	8	8-7/16	9-11/16	5/16	6.87
829-100C	10	10-1/4	12	1/4	12.11
829-100CF	10	12-1/2	11-13/16	2	16.78
829-120C	12	12-3/8	14-1/4	3/8	19.98
829-120CF	12	14-1/4	14-1/8	2	27.71

REDUCER COUPLING

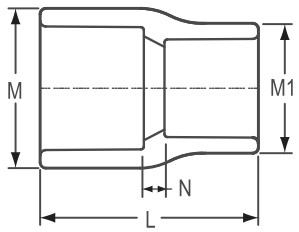
Soc x Soc



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
CPVC						CPVC
829-101C	3/4x1/2	1-31/32	1-13/32	1-3/16	7/32	.07
829-130C	1x1/2	2-3/16	1-23/32	1-13/32	7/32	.12
829-131C	1x3/4	2-13/32	1-23/32	1-13/32	1/4	.10
829-166C	1-1/4x1/2	2-1/4	2-1/16	1-5/32	1/8	.15
829-167C	1-1/4x3/4	2-19/32	2-3/32	1-5/8	3/8	.18
829-168C	1-1/4x1	2-23/32	2-3/32	1-23/32	3/8	.15
829-209C	1-1/2x1/2	2-27/32	2-11/32	1-3/16	19/32	.20
829-210C	1-1/2x3/4	2-7/8	2-3/8	1-13/32	17/32	.19
829-211C	1-1/2x1	2-7/8	2-11/32	1-15/16	3/8	.25
829-212C	1-1/2x1-1/4	2-13/16	2-3/8	2-3/32	5/32	.22
829-247C	2x1/2	3-3/32	2-7/8	1-3/16	3/4	.31
829-248C	2x3/4	3-7/32	2-7/8	1-13/32	23/32	.32
829-249C	2x1	3-1/8	2-7/8	1-23/32	17/32	.30
829-250C	2x1-1/4	3-11/32	2-7/8	2-3/32	19/32	.33
829-251C	2x1-1/2	3-7/32	2-27/32	2-11/32	7/32	.31

REDUCER COUPLING (continued)

Soc x Soc

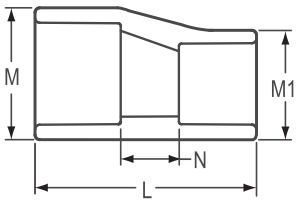


Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
CPVC						CPVC
829-291C	2-1/2x1-1/2	3-1/2	2-11/32	9/16	3-11/16	.51
829-292C	2-1/2x2	3-21/32	3-15/32	2-27/32	13/32	.51
829-335C	3x1	4-7/16	4-1/8	2-7/8	1-7/16	1.04
829-337C[1]	3x1/2	4-13/32	4-5/32	2-7/8	1-3/16	.96
829-338C	3x2	4	4-5/32	2-27/32	11/16	.76
829-339C[1]	3x2-1/2	4-9/32	4-7/32	4-7/32	5/16	1.31
829-416C[1]	4x3/4	5-1/8	5-9/32	2-7/8	1-7/8	1.60
829-417C[1]	4x1	5-1/8	5-9/32	2-29/32	1-23/32	1.54
829-419C[1]	4x1-1/2	5-3/16	5-9/32	2-29/32	2-9/16	1.56
829-420C	4x2	4-5/8	5-9/32	2-7/8	13/16	1.27
829-421C	4x2-1/2	4-9/16	5-3/16	3-1/2	17/32	1.35
829-422C	4x3	4-5/8	5-1/4	4-1/8	1/2	1.33
---	4-1/2x4	6-13/16	5-5/8	5-1/4	2-1/16	---
829-528C[1]	6x2	7-1/16	7-1/2	5	2-9/16	4.42
829-529C[1]	6x2-1/2	7-1/2	7-1/2	5	2-1/2	4.72
829-530C[1]	6x3	7-1/8	7-9/16	5-9/32	2-1/4	4.25
829-530CF	6x3	11-3/4	7-5/16	4-1/8	6-1/4	4.29
829-532C	6x4	6-5/8	7-5/8	5-5/16	1-7/16	3.45
---	6x4-1/2	9	7-3/8	5-11/16	3-1/4	---
829-533CF	6x5	8-3/4	7-3/8	6-5/16	2-1/2	3.93
---	8x3	15	9-1/2	5-3/16	8-3/4	---
829-582C[1]	8x4	9	9-23/32	5-1/4	2-5/8	6.47
829-582CF	8x4	14-1/2	9-1/2	5-3/16	8	9.36
829-585C	8x6	8	9-3/4	7-1/2	1	6.48
---	10x3	22	11-3/4	5-3/16	14-3/4	---
829-624CF	10x4	21-1/4	11-3/4	5-3/16	13-3/4	16.54
829-626CF	10x6	18-1/4	11-3/4	7-1/2	9-3/4	15.00
829-628C	10x8	10-5/8	12	9-3/4	1-17/32	11.44
829-628CF	10x8	13-1/2	11-3/4	9-5/8	4	13.52
829-664CF	12x4	28-1/4	13-15/16	5-3/16	19-3/4	32.77
829-666CF	12x6	24-1/2	13-15/16	7-1/2	15	25.86
829-668C	12x8	12-5/8	14-7/32	9-3/4	2-7/16	19.26
829-668CF	12x8	20	13-15/16	9-5/8	9-1/2	24.34

[1] Outlet sized with bushing

ECCENTRIC REDUCER COUPLING

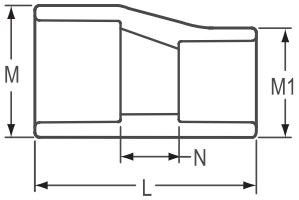
Soc x Soc



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
CPVC						CPVC
829-168CFE	1-1/4x1	4-7/8	2-1/16	1-11/16	2-1/8	.30
829-212CFE	1-1/4x1-1/2	5	2-5/16	2-1/16	2	.46
829-249CFE	2x1	6	2-3/4	1-11/16	3	.37
829-250CFE	2x1-1/4	6-1/4	2-3/4	2-1/16	3	.46
829-251CFE	2x1-1/2	5-3/4	2-3/4	2-5/16	2-1/2	.47
829-290CFE	2-1/2x1-1/4	11	3-5/16	2-1/16	7-1/2	1.15
829-291CFE	2-1/2x1-1/2	10-1/4	3-5/16	2-5/16	6-3/4	1.24
829-292CFE	2-1/2x2	7-1/8	3-5/16	2-13/16	3-3/8	.86
829-335CFE	3x1	11-3/4	3-15/16	1-11/16	8-1/4	1.58
829-336CFE	3x1-1/4	12-1/4	3-15/16	2-1/16	8-1/2	1.27
829-337CFE	3x1-1/2	11-1/2	3-15/16	2-5/16	7-3/4	1.41
829-338CFE	3x2	8-1/8	3-15/16	2-13/16	4-1/8	.99
829-339CFE	3x2-1/2	7-3/8	4-1/16	3-7/16	3-1/8	1.26
829-417CFE	4x1	16-7/8	5-1/8	1-11/16	13-3/8	3.48
829-418CFE	4x1-1/4	17-3/8	5-1/8	2-1/16	13-5/8	3.00
829-419CFE	4x1-1/2	16-5/8	5-1/8	2-5/16	12-7/8	3.38
829-420CFE	4x2	13-1/4	5-1/8	2-13/16	9-1/4	2.47
829-421CFE	4x2-1/2	12-1/2	5-1/8	3-7/16	8-1/4	2.58
829-422CFE	4x3	8-3/4	5-1/8	4-1/8	4-1/4	2.04
829-528CFE	6x2	22-3/4	7-5/16	2-13/16	17-3/4	7.02
829-529CFE	6x2-1/2	22	7-5/16	3-7/16	16-3/4	7.48
829-530CFE	6x3	18-1/4	7-5/16	4-1/8	12-3/4	6.16
829-532CFE	6x4	13	7-5/16	5-3/16	7-1/2	4.43
829-533CFE	6x5	11-3/8	7-3/8	6-5/16	5-1/8	6.44
829-578CFE	8x2	32-1/2	9-1/2	2-13/16	26-1/2	17.32
829-580CFE	8x3	28	9-1/2	4-1/8	21-1/2	16.42
829-582CFE	8x4	23-3/4	9-1/2	5-3/16	16-1/4	13.59
829-583CFE	8x5	21-1/8	9-1/2	6-5/16	13-7/8	11.81
829-585CFE	8x6	15-1/4	9-1/2	7-1/2	7-3/4	9.78
829-624CFE	10x4	34	11-3/4	5-3/16	26-1/2	29.89
829-625CFE	10x5	32-3/8	11-3/4	6-5/16	24-1/8	27.68
829-626CFE	10x6	26-3/8	11-3/4	7-1/2	17-7/8	25.59
829-628CFE	10x8	18-1/4	11-3/4	9-5/8	8-3/4	17.28
829-664CFE	12x4	45-1/4	13-15/16	7-1/2	36-3/4	56.73

ECCENTRIC REDUCER COUPLING (continued)

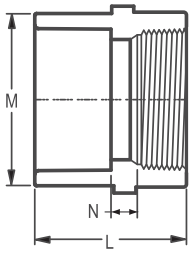
Soc x Soc



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
CPVC						CPVC
829-666CFE	12x6	38	13-15/16	7-1/2	28-1/2	52.43
829-668CFE	12x8	28-1/2	14	9-5/8	18	34.80
829-670CFE	12x10	20-1/2	13-15/16	11-15/16	9	29.09

FEMALE ADAPTER

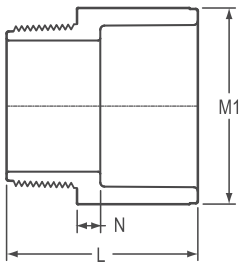
Soc x Fipt



Part Number	Size	L	M	N	Approx. Wt. (Lbs.)
CPVC					CPVC
835-002C	1/4	1-11/32	27/32	3/32	.02
835-003C	3/8	1-15/32	1	3/32	.04
835-005C	1/2	1-23/32	1-5/32	3/32	.06
835-007C	3/4	1-27/32	1-13/32	1/32	.08
835-010C	1	2-1/8	1-23/32	1/32	.14
835-012C	1-1/4	2-3/8	2-1/4	1/8	.22
835-015C	1-1/2	2-1/2	2-11/32	3/32	.20
835-020C	2	2-11/16	3-1/32	1/8	.41
835-025C	2-1/2	3-5/8	3-17/32	9/32	.73
835-030C	3	3-25/32	4-1/4	9/32	.76
835-040C	4	3-31/32	5-7/32	1/4	1.71
835-060C	6	4-15/16	7-5/8	1/4	3.11
835-080C	8	6-3/16	9-3/4	5/8	5.39
835-080CF	8	8	9-5/8	1-7/8	6.56
835-100CF	10	10-1/4	11-15/16	3-1/16	13.43
835-120CF	12	11-1/8	14-1/8	2-1/4	20.00

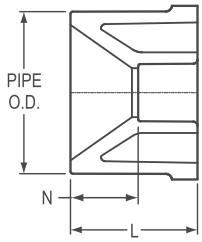
MALE ADAPTER

Mipt x Soc



Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
CPVC					CPVC
836-005C	1/2	1-13/16	1-3/16	3/16	.05
836-007C	3/4	1-29/32	1-13/32	1/4	.06
836-010C	1	2-3/16	1-3/4	9/32	.12
836-012C	1-1/4	2-1/2	2-1/8	9/32	.16
836-015C	1-1/2	2-17/32	2-3/8	13/32	.20
836-020C	2	2-23/32	2-7/8	9/32	.29
836-025C	2-1/2	3-1/2	3-17/32	13/32	.57
836-030C	3	3-3/4	4-3/16	9/16	.77
836-040C	4	4-3/8	5-3/16	1/2	1.22
836-060C	6	5-7/16	7-1/2	13/16	3.07
836-080CF	8	8-7/16	9-3/4	2-1/2	5.95
836-100CF	10	10	11-15/16	2-5/8	10.95
836-120CF	12	13-3/8	14-1/8	5-1/4	19.99

REDUCER BUSHING
Flush Style
Spig x Soc



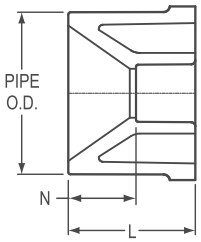
Part Number	Size	L	N	Approx. Wt. (Lbs.)
CPVC				CPVC
837-101C	3/4x1/2	1-1/8	3/8	.03
837-130C	1x1/2	1-5/8	13/32	.07
837-131C	1x3/4	1-1/4	1/4	.04
837-166C	1-1/4x1/2	1-9/16	21/32	.09
837-167C	1-1/4x3/4	1-7/16	7/16	.12
837-168C	1-1/4x1	1-19/32	15/32	.09
837-209C	1-1/2x1/2	1-23/32	13/16	.18
837-210C	1-1/2x3/4	1-3/4	11/16	.20
837-211C	1-1/2x1	1-17/32	13/32	.15
837-212C	1-1/2x1-1/4	1-9/16	5/16	.07
837-247C	2x1/2	1-29/32	1	.30
837-248C	2x3/4	1-15/16	1	.27
837-249C	2x1	1-29/32	13/16	.28
837-250C	2x1-1/4	1-11/16	7/16	.23
837-251C	2x1-1/2	1-3/4	11/32	.16
---	2-1/2X1/2	2-1/2	1-1/2	---
---	2-1/2x3/4	2-17/32	1-15/32	---
837-289C	2-1/2x1	1-31/32	13/16	.53
837-290C	2-1/2x1-1/4	2-5/32	31/32	.46
837-291C	2-1/2x1-1/2	2-13/32	1	.43
837-292C	2-1/2x2	2	7/16	.28
837-334C[1]	3x3/4	2-9/16	1-17/32	.74
837-335C	3x1	2-1/4	1-3/16	.70
837-336C	3x1-1/4	2-1/4	1	.70
837-337C	3x1-1/2	2-1/4	7/8	.67

[1] Outlet sized with bushing

REDUCER BUSHING (continued)

Flush Style

Spig x Soc

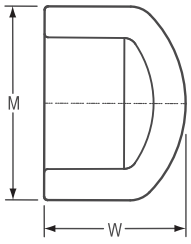


Part Number	Size	L	N	Approx. Wt. (Lbs.)
CPVC				CPVC
837-338C	3x2	2-5/16	1	.65
837-339C	3x2-1/2	2-1/8	5/16	.41
---	4x1	3-1/16	1-1/8	---
837-418C[1]	4x1-1/4	3-9/16	1-11/16	1.38
---	4x1-1/2	4-7/8	3-7/16	---
837-420C	4x2	2-5/8	1-1/8	1.13
837-421C[1]	4x2-1/2	2-15/16	7/8	1.27
837-422C	4x3	2-7/32	11/32	.86
---	6x3/4	4-1/2	3-1/2	---
---	6x1-1/4	4-7/16	2-3/4	---
837-528C	6x2	3-9/32	1-25/32	2.64
837-530C	6x3	3-1/4	1-13/32	2.77
837-532C	6x4	4	1-23/32	3.04
837-578C[1]	8x2	4-15/16	3-3/8	8.99
837-580C[1]	8x3	5-1/8	3-1/4	8.81
837-582C	8x4	4-1/4	2-1/16	9.01
837-585C	8x6	4-1/4	1-5/16	5.15
837-624C[1]	10x4	6	3-3/4	11.36
837-626C	10x6	5-7/16	2-13/32	8.41
837-628C	10x8	6-7/16	1-15/16	10.84
---	12x6	7	4	---
837-666CF	12x6	6-1/2	3	19.45
837-668C	12x8	6-7/8	2-7/16	10.95
---	12x10	6-7/16	1-13/32	---
837-670CF	12x10	6	3/4	11.78

[1] Oultet sized with bushing

CAP

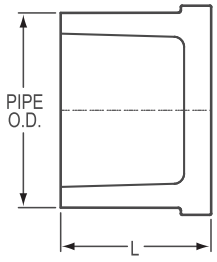
Soc



Part Number	Size	M	W	Approx. Wt. (Lbs.)
CPVC				CPVC
847-005C	1/2	1-3/16	1-7/32	.03
847-007C	3/4	1-3/8	1-13/32	.05
847-010C	1	1-11/16	1-19/32	.08
847-012C	1-1/4	2-3/32	1-27/32	.13
847-015C	1-1/2	2-11/32	2	.17
847-020C	2	2-27/32	2-9/32	.37
847-025C	2-1/2	3-9/16	2-11/16	.52
847-030C	3	4-5/32	3-1/32	.93
847-040C	4	5-7/32	3-9/16	1.46
847-060C	6	7-1/2	4-7/8	3.22
847-080C	8	9-11/16	6-1/2	6.36
847-100CF	10	12-1/4	6	9.12
847-120CF	12	14-1/4	6-7/8	11.72

PLUG

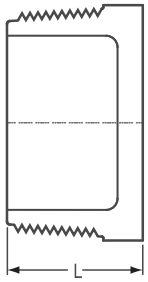
Spig



Part Number	Size	L	Approx. Wt. (Lbs.)
CPVC			CPVC
---	1/2	1-5/32	---
---	3/4	1-1/4	---
849-010C	1	1-3/8	.07
---	1-1/4	1-17/32	---
---	1-1/2	1-11/16	---
849-020C	2	1-7/8	.24
849-030CF	3	5-5/8	1.42
849-040CF	4	6-1/2	3.00
849-060CF	6	9-5/8	8.59

PLUG

Mipt

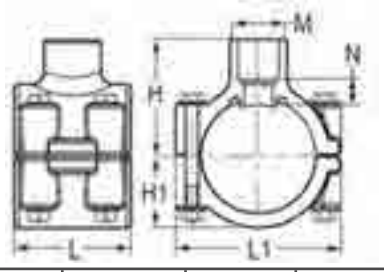


Part Number	Size	L	Approx. Wt. (Lbs.)
CPVC			CPVC
850-005C	1/2	7/8	.02
850-007C	3/4	7/8	.03
850-010C	1	1-1/4	.06
850-012C	1-1/4	1-9/32	.08
850-015C	1-1/2	1-7/32	.11
850-020C	2	1-7/16	.20
850-025C	2-1/2	1-25/32	.33
850-030C	3	1-7/8	.50
850-040C	4	2-3/32	.79
850-060C	6	2-3/32	1.75
850-080CF	8	10-1/4	12.39
850-100CF	10	9-5/8	16.81

CLAMP-ON SADDLE x SOCKET
SINGLE OUTLET

Dimensions Also Applicable to
866**S**-XXX, 866**V**-XXX & 866**SV**-XXX

2"- 4" 235 psi @ 73°F
6" 200 psi @ 73°F
8" - 12" 150 psi @ 73°F



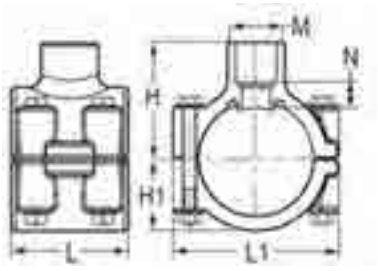
Part Number	Size	H	H1	L	L1	M	N	Approx. Wt. (Lbs.)
CPVC								CPVC
866-247C	2x1/2	2-3/8	1-1/2	2-7/16	3-7/16	1-3/16	5/16	.59
866-248C	2x3/4	2-1/2	1-1/2	2-7/16	3-7/16	1-3/8	5/16	.60
866-249C	2x1	2-5/8	1-1/2	2-7/16	3-7/16	1-11/16	5/16	.62
866-250C	2x1-1/4	2-3/4	1-1/2	2-7/16	3-7/16	2-1/16	5/16	.64
866-251C	2x1-1/2	2-15/16	1-1/2	2-7/16	3-7/16	2-3/8	5/16	.70
866-291C	2-1/2x1-1/2	3-3/16	1-11/16	4-1/16	4	2-3/8	3/8	1.09
866-333C[1]	3x1/2	3-5/16	2-1/16	3	4-5/8	1-3/8	13/16	.92
866-334C	3x3/4	3-1/16	2-1/16	3	4-5/8	1-3/8	9/32	.89
866-335C	3x1	3-3/16	2-1/16	3	4-5/8	1-11/16	5/16	.91
866-336C[1]	3x1-1/4	4-1/32	2-1/16	4-3/32	4-5/8	3	1-1/32	1.56
866-337C[1]	3x1-1/2	4-1/32	2-1/16	4-3/32	4-5/8	3	29/32	1.52
866-338C	3x2	3-5/8	2-1/16	4-3/32	4-5/8	3	3/8	1.31
866-415C[1]	4x1/2	4-3/32	2-5/8	3	5-9/16	2-3/8	31/32	1.38
866-416C[1]	4X3/4	4-3/32	2-5/8	3	5-9/16	2-3/8	27/32	1.35
866-417C	4x1	3-13/16	2-5/8	3	5-5/8	1-11/16	7/16	1.31
866-418C[1]	4x1-1/4	4-13/32	2-5/8	4-3/32	5-5/8	2-3/8	29/32	1.80
866-419C	4x1-1/2	4-1/8	2-5/8	4-3/32	5-9/16	2-3/8	1/2	1.72
866-420C	4x2	4-3/16	2-5/8	4-1/8	5-5/8	3	7/16	1.79
866-421C[1]	4x2-1/2	5	2-5/8	5-7/16	5-23/32	4-9/32	3/4	2.95
866-422C	4x3	4-5/8	2-19/32	5-7/16	5-11/16	4-1/4	1/2	2.57
866-523C[1]	6x1/2	5-13/32	3-7/8	3	7-3/4	1-11/16	1-7/32	2.50
866-524C[1]	6x3/4	5-7/16	3-7/8	3	7-3/4	1-11/16	1-1/8	2.47
866-525C	6x1	5-1/8	3-7/8	3	7-15/16	1-11/16	11/16	2.43
866-526C[1]	6x1-1/4	5-15/16	3-7/8	4-1/8	7-3/4	3	1-3/8	3.48
866-527C[1]	6x1-1/2	5-15/16	3-7/8	4-1/8	7-3/4	3	1-1/4	3.43
866-528C	6x2	5-1/2	3-7/8	4-1/8	7-3/4	3	11/16	3.23
866-529C[1]	6x2-1/2	6-7/16	3-7/8	6	7-15/16	4-1/4	1-1/8	5.02
866-530C	6x3	5-15/16	3-7/8	6	7-15/16	4-1/4	25/32	4.61
866-532C	6x4	6	3-29/32	6	7-15/16	5-3/16	5/8	5.49

[1] Outlet sized with bushing

CLAMP-ON SADDLE x SOCKET (continued)
SINGLE OUTLET

Dimensions Also Applicable to
866**S**-XXX, 866**V**-XXX & 866**SV**-XXX

2" - 4" 235 psi @ 73°F
6" 200 psi @ 73°F
8" - 12" 150 psi @ 73°F



Part Number	Size	H	H1	L	L1	M	N	Approx. Wt. (Lbs.)
CPVC								CPVC
866-573C[1]	8x1/2	7-3/4	4-7/8	9-1/2	8-1/2	5-5/16	1-1/2	---
866-574C[1]	8x3/4	8-3/32	4-7/8	8-1/2	10-1/8	5-1/4	2-3/4	---
866-575C[1]	8x1	8-3/32	4-7/8	8-1/2	10-1/8	5-1/4	2-5/8	---
866-576C[1]	8x1-1/4	8-3/32	4-7/8	8-1/2	10-1/8	5-1/4	2-1/2	---
866-577C[1]	8x1-1/2	8-3/32	4-7/8	8-1/2	10-1/8	5-1/4	2-3/8	---
866-578C[1]	8x2	7-11/16	4-7/8	8-1/2	10-1/8	5-1/4	1-7/8	---
866-579C[1]	8x2-1/2	8-5/32	4-7/8	8-15/32	10	5-7/32	2-1/2	---
866-580C[1]	8x3	7-1/16	4-7/8	8-1/2	10-1/8	5-1/4	1-7/16	---
866-582C	8x4	7-5/16	4-7/8	8-1/2	10-1/8	5-1/4	11/16	4.38
866-585C	8x6	8-3/32	4-7/8	8-1/2	10-1/8	7-5/8	11/16	9.30
866-621C[1]	10x2	8-7/8	6-1/32	8-1/2	12-5/16	5-1/4	1-15/16	---
866-624C	10x4	8-15/32	6-1/32	8-1/2	12-5/16	5-1/4	13/16	---
866-626C	10x6	9-9/32	6-1/32	8-1/2	12-5/16	7-5/8	13/16	---
866-664C	12x4	9-9/16	7-5/32	8-1/2	14-5/16	5-1/4	7/8	---
866-666C	12x6	10-3/8	7-5/32	8-1/2	14-5/16	7-5/8	7/8	---

[1] **Oultet sized with bushing**

1) Clamp On Saddle Standard Hardware: Zinc Bolts w/EPDM O-ring Seal
e.g. Part Number 866-247 = 2x1/2 PVC Clamp On Saddle, Socket, EPDM O-ring, Zinc Bolts.

2) Clamp On Saddles w/Stainless Steel (SS) Bolts,Add The Letter **"S"** Before The Dash.
e.g. Part Number 866**S**-247 = 2x1/2 PVC Clamp On Saddle, Socket, EPDM O-ring, Stainless Steel Bolts.

3) Clamp On Saddles w/Viton® O-ring Seal, Add The Letter **"V"** Before The Dash.
e.g. Part Number 866**V**-247 = 2x1/2 PVC Clamp-On Saddle, Socket, Viton® O-ring, Zinc Bolts.

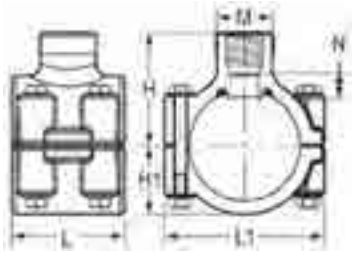
4) Clamp-On Saddles w/Stainless Steel Bolts & Viton® O-ring Seal, Add The Letter **"SV"** Before The Dash.
e.g. Part Number 866**SV**-247 = 2x1/2 PVC Clamp On Saddle, Socket Viton® O-ring, Stainless Steel Bolts.

Viton® is registered trademark of DuPont Dow Elastomers.

CLAMP-ON SADDLE x SR FIPT
SINGLE OUTLET

Dimensions Also Applicable to
867**S**-XXXSR, 867**V**-XXXSR & 867**SV**-XXXSR

2" - 4" 235 psi @ 73°F
6" 200 psi @ 73°F
8" - 12" 150 psi @ 73°F



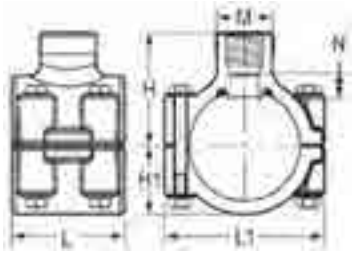
Part Number	Size	H	H1	L	L1	M	N	Approx. Wt. (Lbs.)
CPVC								CPVC
867-247CSR	2x1/2	2-3/8	1-1/2	2-7/16	3-7/16	1-3/16	5/16	.59
867-248CSR	2x3/4	2-1/2	1-1/2	2-7/16	3-7/16	1-3/8	5/8	.60
867-249CSR	2x1	2-5/8	1-1/2	2-7/16	3-7/16	1-11/16	9/16	.62
867-250CSR	2x1-1/4	2-3/4	1-1/2	2-7/16	3-7/16	2-1/16	11/16	.64
867-251CSR	2x1-1/2	2-15/16	1-1/2	2-7/16	3-7/16	2-3/8	3/4	.70
867-291CSR	2-1/2x1-1/2	3-3/16	1-11/16	4-1/16	4	2-3/8	13/16	1.09
867-333CSR[1]	3x1/2	3-5/16	2-1/16	3	4-5/8	1-3/8	15/16	.93
867-334CSR	3x3/4	3-1/16	2-1/16	3	4-5/8	1-3/8	9/16	.91
867-335CSR	3x1	3-3/16	2-1/16	3	4-5/8	1-11/16	9/16	.93
867-336CSR[1]	3x1-1/4	4-1/32	2-1/16	4-3/32	4-5/8	3	1-5/16	1.61
867-337CSR[1]	3x1-1/2	4-1/32	2-1/16	4-3/32	4-5/8	3	2-11/16	1.56
867-338CSR	3x2	3-5/8	2-1/16	4-3/32	4-5/8	3	7/8	1.40
867-415CSR[1]	4x1/2	4-3/32	2-5/8	3	5-9/16	2-3/8	1-1/8	1.39
867-416CSR[1]	4X3/4	4-3/32	2-5/8	3	5-9/16	2-3/8	1-1/8	1.38
867-417CSR	4x1	3-13/16	2-5/8	3	5-5/8	1-11/16	11/16	1.33
867-418CSR[1]	4x1-1/4	4-13/32	2-5/8	4-3/32	5-5/8	2-3/8	1-7/32	1.85
867-419CSR[1]	4x1-1/2	4-1/8	2-5/8	4-3/32	5-9/16	2-3/8	15/16	1.78
867-420CSR	4x2	4-3/16	2-5/8	4-1/8	5-5/8	3	15/16	1.87
867-421CSR[1]	4x2-1/2	5	2-5/8	5-7/16	5-23/32	4-9/32	1-7/32	3.13
867-422CSR	4x3	4-5/8	2-19/32	5-7/16	5-11/16	4-1/4	31/32	2.69
867-523CSR[1]	6x1/2	5-13/32	3-7/8	3	7-3/4	1-11/16	1-3/8	2.50
867-524CSR[1]	6x3/4	5-7/16	3-7/8	3	7-3/4	1-11/16	1-3/8	2.50
867-525CSR	6x1	5-1/8	3-7/8	3	7-15/16	1-11/16	15/16	2.45
867-526CSR[1]	6x1-1/4	5-15/16	3-7/8	4-1/8	7-3/4	3	1-11/16	3.52
867-527CSR[1]	6x1-1/2	5-15/16	3-7/8	4-1/8	7-3/4	3	1-3/4	3.48
867-528CSR	6x2	5-1/2	3-7/8	4-1/8	7-3/4	3	1-7/32	3.32
867-529CSR[1]	6x2-1/2	6-7/16	3-7/8	6	7-15/16	4-1/4	1-9/16	5.17
867-530CSR	6x3	5-15/16	3-7/8	6	7-15/16	4-1/4	1-1/4	4.78
867-532CSR	6x4	6	3-29/32	6	7-15/16	5-3/16	1-3/8	5.78

[1] **Outlet sized with bushing**

CLAMP-ON SADDLE x SR FIPT (continued)
SINGLE OUTLET

Dimensions Also Applicable to
867**S**-XXXSR, 867**V**-XXXSR & 867**SV**-XXXSR

2" - 4" 235 psi @ 73°F
6" 200 psi @ 73°F
8" - 12" 150 psi @ 73°F



Part Number	Size	H	H1	L	L1	M	N	Approx. Wt. (Lbs.)
CPVC								CPVC
867-573CSR	8x1/2	8-3/32	4-7/8	8-1/2	10-1/8	5-1/4	3	---
867-574CSR[1]	8x3/4	8-3/32	4-7/8	8-1/2	10-1/8	5-1/4	3	---
867-575CSR	8x1	8-3/32	4-7/8	8-1/2	10-1/8	5-1/4	2-13/16	---
867-576CSR[1]	8x1-1/4	9-5/16	4-15/16	8-9/16	9-29/32	5-7/32	1-19 /32	---
867-577CSR[1]	8x1-1/2	8-3/32	4-7/8	8-1/2	10-1/8	5-1/4	2-3/4	---
867-578CSR[1]	8x2	7-11/16	4-7/8	8-1/2	10-1/8	5-1/4	2-3/8	---
867-579CSR[1]	8x2-1/2	8-1/8	4-7/8	8-1/2	10-1/8	5-1/4	2-1/2	---
867-580CSR[1]	8x3	7-1/16	4-7/8	8-1/2	10-1/8	5-1/4	1-15/16	---
867-582CSR	8x4	7-5/16	4-7/8	8-1/2	10-1/8	5-1/4	1-1/2	8.09
867-585CSR	8x6	8-3/32	4-7/8	8-1/2	10-1/8	7-5/8	2-3/32	9.08
867-624CSR	10x4	8-15/32	6-1/32	8-1/2	12-5/16	5-1/4	2-3/16	---
867-626CSR	10x6	9-9/32	6-1/32	8-1/2	12-5/16	7-5/8	3-3/16	---
867-664CSR	12x4	9-9/16	7-5/32	8-1/2	14-5/16	5-1/4	1-5/8	---
867-666CSR	12x6	10-3/8	7-5/32	8-1/2	14-5/16	7-5/8	2-1/4	---

[1] **Outlet sized with bushing**

1) Clamp On Saddle Standard Hardware: Zinc Bolts w/EPDM O-ring Seal
e.g. Part Number 867-247SR = 2x1/2 PVC Clamp On Saddle, SR Threaded, EPDM O-ring, Zinc Bolts.

2) Clamp On Saddles w/Stainless Steel (SS) Bolts,Add The Letter **"S"** Before The Dash.
e.g. Part Number 867**S**-247SR = 2x1/2 PVC Clamp On Saddle, SR Threaded, EPDM O-ring, Stainless Steel Bolts.

3) Clamp On Saddles w/Viton® O-ring Seal, Add The Letter **"V"** Before The Dash.
e.g. Part Number 867**V**-247SR = 2x1/2 PVC Clamp-On Saddle, SR Threaded, Viton® O-ring, Zinc Bolts.

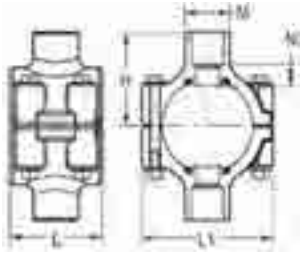
4) Clamp-On Saddles w/Stainless Steel Bolts & Viton® O-ring Seal, Add The Letter **"SV"** Before The Dash.
e.g. Part Number 867**SV**-247SR = 2x1/2 PVC Clamp On Saddle, SR Threaded Viton® O-ring, Stainless Steel Bolts.

Viton® is a registered trademark of DuPont Dow Elastomers.

CLAMP-ON SADDLE x SOCKET DOUBLE OUTLET

Dimensions Also Applicable to
868**S**-XXX, 868**V**-XXX & 868**SV**-XXX

2" - 4" 235 psi @ 73°F
6" 200 psi @ 73°F
8" - 12" 150 psi @ 73°F



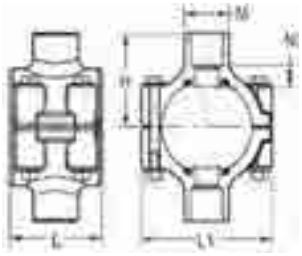
Part Number	Size	H	L	L1	M	N	Approx. Wt. (Lbs.)
CPVC							CPVC
868-247C	2x1/2	2-3/8	2-7/16	3-7/16	1-3/16	5/16	.59
868-248C	2x3/4	2-1/2	2-7/16	3-7/16	1-3/8	5/16	.60
868-249C	2x1	2-5/8	2-7/16	3-7/16	1-11/16	5/16	.62
838-250C	2x1-1/4	2-3/4	2-7/16	3-7/16	2-1/16	5/16	.64
868-251C	2x1-1/2	2-15/16	2-7/16	3-7/16	2-3/8	5/16	.70
868-291C	2-1/2x1-1/2	3-3/16	4-1/16	4	2-3/8	3/8	1.09
868-333C[1]	3x1/2	3-5/16	3	4-5/8	1-3/8	13/16	.97
868-334C	3x3/4	3-1/16	3	4-5/8	1-3/8	9/32	.92
868-335C	3x1	3-3/16	3	4-5/8	1-11/16	5/16	.96
868-336C[1]	3x1-1/4	4-1/32	4-3/32	4-5/8	3	1-1/32	2.06
868-337C[1]	3x1-1/2	4-1/32	4-3/32	4-5/8	3	29/32	1.97
868-338C	3x2	3-5/8	4-3/32	4-5/8	3	3/8	1.57
868-415C[1]	4x1/2	4-3/32	3	5-9/16	2-3/8	31/32	1.51
868-416C[1]	4X3/4	4-3/32	3	5-9/16	2-3/8	27/32	1.46
868-417C	4x1	3-13/16	3	5-5/8	1-11/16	7/16	1.37
868-418C[1]	4x1-1/4	4-13/32	4-3/32	5-5/8	2-3/8	29/32	2.04
868-419C	4x1-1/2	4-1/8	4-3/32	5-9/16	2-3/8	1/2	1.87
868-420C	4x2	4-3/16	4-1/8	5-5/8	3	7/16	2.01
868-421C[1]	4x2-1/2	5	5-7/16	5-23/32	4-9/32	3/4	3.98
868-422C	4x3	4-5/8	5-7/16	5-11/16	4-1/4	1/2	3.16
868-523C[1]	6x1/2	5-13/32	3	7-3/4	1-11/16	1-7/32	2.63
868-524C[1]	6x3/4	5-7/16	3	7-3/4	1-11/16	1-1/8	2.58
868-525C	6x1	5-1/8	3	7-15/16	1-11/16	11/16	2.49
868-526C[1]	6x1-1/4	5-15/16	4-1/8	7-3/4	3	1-3/8	3.93
868-527C[1]	6x1-1/2	5-15/16	4-1/8	7-3/4	3	1-1/4	3.84
868-528C	6x2	5-1/2	4-1/8	7-3/4	3	11/16	3.44
868-529C[1]	6x2-1/2	6-7/16	6	7-15/16	4-1/4	1-1/8	5.93
868-530C	6x3	5-15/16	6	7-15/16	4-1/4	25/32	5.11
868-532C	6x4	6	6	7-15/16	5-3/16	5/8	6.10
868-573C[1]	8x1/2	8-3/32	8-1/2	10-1/8	5-1/4	2-3/16	12.06

[1] Outlet sized with bushing

CLAMP-ON SADDLE x SOCKET (continued)
DOUBLE OUTLET

Dimensions Also Applicable to
868**S**-XXX, 868**V**-XXX & 868**SV**-XXX

2" - 4" 235 psi @ 73°F
6" 200 psi @ 73°F
8" - 12" 150 psi @ 73°F



Part Number	Size	H	L	L1	M	N	Approx. Wt. (Lbs.)
CPVC							CPVC
868-574C[1]	8x3/4	8-3/32	8-1/2	10-1/8	5-1/4	2-3/4	12.01
868-575C[1]	8x1	8-3/32	8-1/2	10-1/8	5-1/4	2-5/8	12.02
868-576C[1]	8x1-1/4	8-3/32	8-1/2	10-1/8	5-1/4	2-1/2	11.88
868-577C[1]	8x1-1/2	8-3/32	8-1/2	10-1/8	5-1/4	2-3/8	11.78
868-578C[1]	8x2	7-11/16	8-1/2	10-1/8	5-1/4	1-7/8	11.47
868-579C[1]	8x2-1/2	8-1/8	8-1/2	10-1/8	5-1/4	1-11/16	9.21
868-580C[1]	8x3	7-1/16	8-1/2	10-1/8	5-1/4	1-7/16	10.92
868-582C	8x4	7-5/16	8-1/2	10-1/8	5-1/4	11/16	8.62
868-585C	8x6	8-3/32	8-1/2	10-1/8	7-5/8	11/16	10.81
868-624C	10x4	8-15/32	8-1/2	12-5/16	5-1/4	13/16	12.99
868-626C	10x6	9-9/32	8-1/2	12-5/16	7-5/8	13/16	15.15
868-664C	12x4	9-9/16	8-1/2	14-5/16	5-1/4	7/8	17.06
868-666C	12x6	10-3/8	8-1/2	14-5/16	7-5/8	7/8	18.64

[1] **Outlet sized with bushing**

1) Clamp On Saddle Standard Hardware: Zinc Bolts w/EPDM O-ring Seal
e.g. Part Number 868-247 = 2x1/2 PVC Clamp On Saddle, Socket, EPDM O-ring, Zinc Bolts.

2) Clamp On Saddles w/Stainless Steel (SS) Bolts,Add The Letter **"S"** Before The Dash.
e.g. Part Number 868**S**-247 = 2x1/2 PVC Clamp On Saddle, Socket, EPDM O-ring, Stainless Steel Bolts.

3) Clamp On Saddles w/Viton® O-ring Seal, Add The Letter **"V"** Before The Dash.
e.g. Part Number 868**V**-247 = 2x1/2 PVC Clamp-On Saddle, Socket, Viton® O-ring, Zinc Bolts.

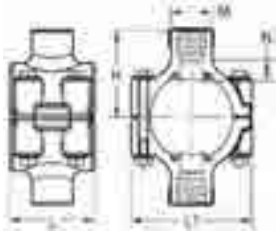
4) Clamp-On Saddles w/Stainless Steel Bolts & Viton® O-ring Seal, Add The Letter **"SV"** Before The Dash.
e.g. Part Number 868**SV**-247 = 2x1/2 PVC Clamp On Saddle, Socket Viton® O-ring, Stainless Steel Bolts.

Viton® is a registered trademark of DuPont Dow Elastomers.

CLAMP-ON SADDLE x SR FIPT
DOUBLE OUTLET

Dimensions Also Applicable to
869**S**-XXXSR, 869**V**-XXXSR & 869**SV**-XXXSR

2" - 4" 235 psi @ 73°F
6" 200 psi @ 73°F
8" - 12" 150 psi @ 73°F



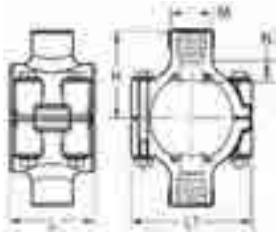
Part Number	Size	H	L	L1	M	N	Approx. Wt. (Lbs.)
CPVC							CPVC
869-247CSR	2x1/2	2-3/8	2-7/16	3-7/16	1-3/16	5/16	.59
869-248CSR	2x3/4	2-1/2	2-7/16	3-7/16	1-3/8	5/8	.60
869-249CSR	2x1	2-5/8	2-7/16	3-7/16	1-11/16	9/16	.62
869-250CSR	2x1-1/4	2-3/4	2-7/16	3-7/16	2-1/16	11/16	.64
869-251CSR	2x1-1/2	2-15/16	2-7/16	3-7/16	2-3/8	3/4	.70
869-291CSR	2-1/2x1-1/2	3-3/16	4-1/16	4	2-3/8	13/16	1.09
869-333CSR[1]	3x1/2	3-5/16	3	4-5/8	1-3/8	15/16	1.00
869-334CSR	3x3/4	3-1/16	3	4-5/8	1-3/8	9/16	.96
869-335CSR	3x1	3-3/16	3	4-5/8	1-11/16	9/16	1.00
869-336CSR[1]	3x1-1/4	4-1/32	4-3/32	4-5/8	3	1-5/16	2.15
869-337CSR[1]	3x1-1/2	4-1/32	4-3/32	4-5/8	3	2-11/16	2.06
869-338CSR	3x2	3-5/8	4-3/32	4-5/8	3	7/8	1.74
869-415CSR[1]	4x1/2	4-3/32	3	5-9/16	2-3/8	1-1/8	1.53
869-416CSR[1]	4x3/4	4-3/32	3	5-9/16	2-3/8	1-1/8	1.52
869-417CSR	4x1	3-13/16	3	5-5/8	1-11/16	11/16	1.41
869-418CSR[1]	4x1-1/4	4-13/32	4-3/32	5-5/8	2-3/8	1-7/32	2.13
869-419CSR	4x1-1/2	4-1/8	4-3/32	5-9/16	2-3/8	15/16	1.99
869-420CSR	4x2	4-3/16	4-1/8	5-5/8	3	15/16	2.18
869-421CSR[1]	4x2-1/2	5	5-7/16	5-23/32	4-9/32	1-7/32	4.29
869-422CSR	4x3	4-5/8	5-7/16	5-11/16	4-1/4	31/32	3.39
869-523CSR[1]	6x1/2	5-13/32	3	7-3/4	1-11/16	1-3/8	2.64
869-524CSR[1]	6x3/4	5-7/16	3	7-3/4	1-11/16	1-3/8	2.63
869-525CSR	6x1	5-1/8	3	7-15/16	1-11/16	15/16	2.53
869-526CSR[1]	6x1-1/4	5-15/16	4-1/8	7-3/4	3	1-11/16	4.03
869-527CSR[1]	6x1-1/2	5-15/16	4-1/8	7-3/4	3	1-3/4	3.93
869-528CSR	6x2	5-1/2	4-1/8	7-3/4	3	1-7/32	3.62
869-529CSR[1]	6x2-1/2	6-7/16	6	7-15/16	4-1/4	1-9/16	6.23
869-530CSR	6x3	5-15/16	6	7-15/16	4-1/4	1-1/4	5.45
869-532CSR	6x4	6	6	7-15/16	5-3/16	1-3/8	6.67
869-573CSR[1]	8x1/2	8-3/32	8-1/2	10-1/8	5-1/4	3	12.02

[1] **Outlet sized with bushing**

CLAMP-ON SADDLE x SR FIPT (continued)
DOUBLE OUTLET

Dimensions Also Applicable to
869**S**-XXXSR, 869**V**-XXXSR & 869**SV**-XXXSR

2" - 4" 235 psi @ 73°F
6" 200 psi @ 73°F
8" - 12" 150 psi @ 73°F



Part Number	Size	H	L	L1	M	N	Approx. Wt. (Lbs.)
CPVC							CPVC
869-574CSR[1]	8x3/4	8-3/32	8-1/2	10-1/8	5-1/4	3	---
869-575CSR[1]	8x1	8-3/32	8-1/2	10-1/8	5-1/4	2-13/16	---
869-576CSR[1]	8x1-1/4	8-3/32	8-1/2	10-1/8	5-1/4	2-3/4	---
869-577CSR[1]	8x1-1/2	8-3/32	8-1/2	10-1/8	5-1/4	2-3/4	---
869-578CSR[1]	8x2	7-11/16	8-1/2	10-1/8	5-1/4	2-3/8	---
869-579CSR[1]	8x2-1/2	8-1/8	8-1/2	10-1/8	5-1/4	2-1/2	---
869-580CSR[1]	8x3	7-1/16	8-1/2	10-1/8	5-1/4	1-15/16	---
869-582CSR	8x4	7-5/16	8-1/2	10-1/8	5-1/4	1-1/2	9.29
869-585CSR	8x6	8-3/32	8-1/2	10-1/8	7-5/8	2-3/32	10.81
869-624CSR	10x4	8-15/32	8-1/2	12-5/16	5-1/4	2-3/16	---
869-626CSR	10x6	9-9/32	8-1/2	12-5/16	7-5/8	3-3/16	---
869-664CSR	12x4	9-9/16	8-1/2	14-5/16	5-1/4	1-5/8	---
869-666CSR	12x6	10-3/8	8-1/2	14-5/16	7-5/8	2-1/4	---

[1] **Outlet sized with bushing**

1) Clamp On Saddle Standard Hardware: Zinc Bolts w/EPDM O-ring Seal
e.g. Part Number 869-247SR = 2x1/2 PVC Clamp On Saddle, SR Threaded, EPDM O-ring, Zinc Bolts.

2) Clamp On Saddles w/Stainless Steel (SS) Bolts,Add The Letter **"S"** Before The Dash.
e.g. Part Number 869**S**-247SR = 2x1/2 PVC Clamp On Saddle, SR Threaded, EPDM O-ring, Stainless Steel Bolts.

3) Clamp On Saddles w/Viton® O-ring Seal, Add The Letter **"V"** Before The Dash.
e.g. Part Number 869**V**-247 = 2x1/2 PVC Clamp-On Saddle, SR Threaded,Viton® O-ring, Zinc Bolts.

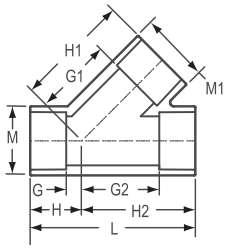
4) Clamp-On Saddles w/Stainless Steel Bolts & Viton® O-ring Seal, Add The Letter **"SV"** Before The Dash.
e.g. Part Number 869**SV**-247SR = 2x1/2 PVC Clamp On Saddle, SR Threaded Viton® O-ring, Stainless Steel Bolts.

Viton® is a registered trademark of DuPont Dow Elastomers.

WYE

Soc x Soc x Soc

1/2" - 2-1/2" 235 psi @ 73°F
3" - 6" 150 psi @ 73°F
8" & Up 100 psi @ 73°F

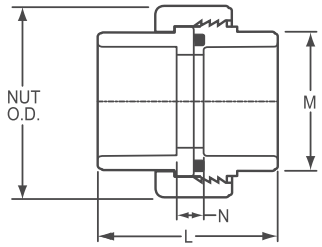


Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	Approx. Wt. (Lbs.)
CPVC											CPVC
875-005C	1/2	1/4	1-5/32	1-5/32	1-1/8	2-1/16	2-1/32	3-3/16	1-5/32	1-5/32	.13
875-007C	3/4	9/32	13/32	13/32	1-9/32	2-7/6	2-13/32	3-11/16	1-3/8	1-3/8	.19
875-010C	1	5/16	1-3/4	1-3/4	1-7/16	2-29/32	2-7/8	4-11/32	1-11/16	1-11/16	.33
875-012C	1-1/4	13/32	2-5/32	2-5/32	1-21/32	3-13/32	3-13/32	5-3/32	2-1/16	2-1/16	.53
875-015C	1-1/2	11/16	2-13/32	2-3/8	2-1/16	3-3/4	3-3/4	5-13/16	2-11/32	2-5/16	.74
875-020C	2	21/32	3-7/32	3-7/32	2-5/32	4-23/32	4-23/32	6-7/8	2-7/8	2-7/8	1.26
875-025C	2-1/2	1	4-7/8	4-7/16	3	6-7/8	6-7/8	9-7/16	4-1/8	4-1/8	3.70
875-030C	3	11/16	4-21/32	4-1/4	2-9/16	6-17/32	6-1/8	8-11/16	4-1/8	4-1/8	2.67
875-040C	4	25/32	6	5-13/32	3	8-1/4	7-11/16	10-11/16	5-1/4	5-1/4	4.70
875-060C	6	1-13/32	8-5/8	7-21/32	4-13/32	11-5/8	10-31/32	15-3/8	7-9/16	7-9/16	12.67
875-080C	8	2-1/16	11-1/16	11-1/4	6-1/16	15-1/4	15-1/4	21-1/4	9-23/32	9-23/32	26.18
875-080CF	8	5-1/16	13-11/16	13-11/16	9-5/16	17-15/16	17-15/16	27-1/4	9-5/8	9-5/8	44.67
875-100CF	10	5-7/8	17-7/8	17-7/8	11-1/8	23-1/8	23-1/8	34-1/4	11-15/16	11-15/16	75.04
875-120CF	12	7-1/8	19-7/8	19-7/8	13-3/8	26-1/8	26-1/8	39-1/2	14-1/8	14-1/8	123.20

UNION (Old Style)

Soc x Soc
Dimensions Also Applicable to
897-XXX EPDM O-ring Seal Units

235 psi @ 73°F



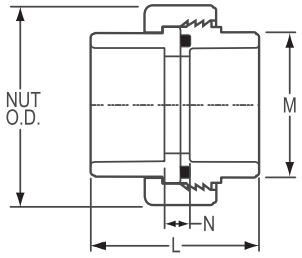
Part Number w/Viton® O-ring Seal	Size	L	M	N	NUT O.D.	Approx. Wt. (Lbs.)
CPVC						CPVC
857-005C	1/2	2-3/32	1-9/32	11/32	1-31/32	.16
857-007C	3/4	2-3/8	1-17/32	11/32	2-1/2	.28
857-010C	1	2-9/16	1-27/32	3/8	2-7/8	.39
857-012C	1-1/4	2-7/8	2-7/32	3/8	3-5/16	.52
857-015C	1-1/2	3-3/32	2-9/16	15/32	3-9/16	.63
857-020C	2	3-5/8	3-1/32	9/16	4-3/16	1.05
857-025C	2-1/2	4-3/8	3-5/8	15/16	4-7/8	1.66
857-030C	3	5-1/16	4-3/8	1-3/16	5-3/4	2.51
857-040C	4	5-7/8	5-13/32	1-3/8	7-1/16	3.98

1) For (Soc X Soc) Unions Equipped With EPDM O-ring, Replace The 857 With An 897 Before The Dash.
e.g. Part Number 897-002 = 1/4" PVC, Union, Soc x Soc, With EPDM O-rings.

UNION 2000

Soc x Soc
Dimensions Also Applicable to
8097-XXX EPDM O-ring Seal Units

1/2" - 4" 235 psi @ 73°F
6" 150 psi @ 73°F



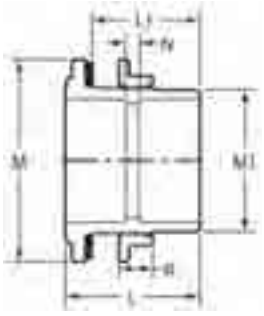
Part Number w/Viton® O-ring Seal	Size	L	M	N	Nut O.D.	Approx. Wt. (Lbs.)
CPVC						CPVC
8057-005C	1/2	2-3/32	1-3/16	11/32	1-7/8	.08
8057-007C	3/4	2-3/8	1-13/32	3/8	2-9/32	.19
8057-010C	1	2-11/16	1-23/32	7/16	2-9/16	.17
8057-012C	1-1/4	2-15/16	2-3/32	7/16	3-3/32	.40
8057-015C	1-1/2	3-1/4	2-3/8	1/2	3-1/2	.51
8057-020C	2	3-17/32	2-7/8	17/32	4-9/32	.89
8057-025C	2-1/2	4-7/32	3-1/2	25/32	6-5/32	2.25
8057-030C	3	4-1/4	4-3/16	1/2	6-5/32	2.50
8057-040C	4	5-1/8	5-1/4	5/8	7-3/4	3.97
8057-060C	6	6-27/32	7-1/2	25/32	11-5/8	10.88

NEW STYLE - TANK ADAPTER

Soc x Soc

Dimensions Also Applicable to 8170**E**-XXX & 8170**V**-XXX

150 psi @ 73°F



Part Number	Size	L	L1	M	M1	N	R	Approx. Wt. (Lbs.)
CPVC								CPVC
8170-005C	1/2	2-15/16	2-3/16	2	1-3/16	1-1/8	5/8	.23
8170-007C	3/4	2-15/16	2-3/16	2-1/4	1-5/8	15/16	5/8	.27
8170-010C	1	3-5/16	2-9/16	2-5/8	2	1-1/16	5/8	.41
8170-012C	1-1/4	3-7/16	2-5/8	3-1/8	2-5/16	15/16	5/8	.45
8170-015C	1-1/2	3-5/8	2-13/16	3-5/8	2-11/16	13/16	5/8	1.04
8170-020C	2	4-1/8	3-1/4	4-7/8	3-1/4	1-1/16	3/4	1.33
8170-025C	2-1/2	4-27/32	3-7/8	5-1/4	3-13/16	1-9/32	1	---
8170-030C	3	5-1/2	4-1/2	6	4-9/16	1-11/16	1	2.69
8170-040C	4	5	4	7-1/2	5-1/2	7/16	1-1/4	3.40
8170-080C	8	8-5/8	7	12-15/16	10-1/4	1/2	1-1/2	17.30

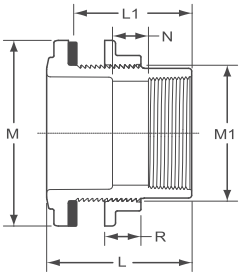
Tank Adapter Referenced Dimension Tolerance = ± 1/16"

NEW STYLE - TANK ADAPTER

Soc x Fipt

Dimensions Also Applicable to 8171**E**-XXX & 8171**V**-XXX

150 psi @ 73°F



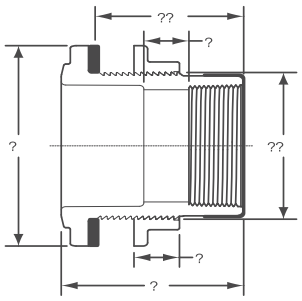
Part Number	Size	L	L1	M	M1	N	R	Approx. Wt. (Lbs.)
CPVC								CPVC
8171-005C	1/2	2-29/32	2-7/16	2-1/32	1-7/32	1-1/2	5/8	.23
8171-007C	3/4	2-15/16	2-15/32	2-1/4	1-5/8	1-3/16	5/8	.26
8171-010C	1	3-5/16	2-13/16	2-5/8	1-31/32	1-1/4	5/8	.38
8171-012C	1-1/4	3-13/32	2-27/32	3-3/32	2-5/16	1-17/32	5/8	.53
8171-015C	1-1/2	3-5/8	2-13/16	3-5/8	2-11/16	1-1/4	5/8	.71
8171-020C	2	4-1/8	3-1/4	4-7/8	3-1/4	1-5/8	3/4	1.34
8171-025C	2-1/2	4-7/8	7/8	5-1/4	3-13/16	1-13/16	1	1.92
8171-030C	3	5-1/2	4-1/2	6	4-9/16	2-3/16	1	2.80
8171-040C	4	5	4	7-1/2	5-1/2	1-1/4	1-1/4	3.36

NEW STYLE - TANK ADAPTER

Soc x SR Fipt

Dimensions Also Applicable to 8171**E**-XXXSR & 8171**V**-XXXSR

150 psi @ 73°F



Part Number CPVC	Size	L	L1	M	M1	N	R	Approx. Wt. (Lbs.) CPVC
8171-005CSR	1/2	2-15/16	2-7/16	2-1/32	1-15/32	1-9/32	5/8	.24
8171-007CSR	3/4	2-15/16	2-3/16	2-1/4	1-5/8	1-1/4	5/8	.28
8171-010CSR	1	3-5/16	2-13/16	2-5/8	1-31/32	1-1/4	5/8	.38
8171-012CSR	1-1/4	3-13/32	2-5/8	3-3/32	2-5/16	1-17/32	5/8	.53
8171-015CSR	1-1/2	3-5/8	2-13/16	3-5/8	2-11/16	1-1/4	5/8	.74
8171-020CSR	2	4-1/8	3-1/4	4-7/8	3-1/4	1-5/8	3/4	1.70
8171-025CSR	2-1/2	4-7/8	3-7/8	5-1/4	3-13/16	1-11/16	1	1.99
8171-030CSR	3	5-1/2	4-1/2	6	4-9/16	2-3/16	1	2.82
8171-040CSR	4	5	4	7-1/2	5-1/2	1-1/4	1-1/4	4.45

TRANSITION UNION

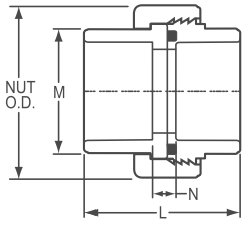
DIN (mm) SOC x ASTM (in) SOC

Dimensions Also Applicable to

8697-XXX EPDM O-ring Seal Units

235 psi @ 73°F

(PN 16 @ 22°C)



Part Number w/Viton® O-ring Seal	Size	L	M	N	Nut O.D.	Approx. Wt. (Lbs.)
8657-020	20 mm x 1/2	2-1/16	1-9/32	5/16	1-31/32	.16
8657-025	25 mm x 3/4	2-11/32	1-17/32	11/32	2-1/2	.27
8657-032	32 mm x 1	2-9/16	1-27/32	3/8	2-7/8	.37
8657-040	40 mm x 1-1/4	2-7/8	2-7/32	3/8	3-5/16	.52
8657-050	50 mm x 1-1/2	3-1/8	2-9/16	5/16	3-9/16	.59
8657-063	63 mm x 2	3-5/8	3-1/32	9/16	4-3/16	.94
8657-090	90 mm x 3	5-1/16	4-3/8	1-3/16	5-3/4	2.31
8657-110	110 mm x 4	5-7/8	5-7/16	1-3/8	7-1/16	3.91

1) For DIN (mm) SOC X ASTM (in) SOC Unions Equipped with EPDM O-ring, Replace The 8657 With An 8697 Before The Dash.
e.g. Part Number 8697-020 = 20mm x 1/2" PVC, Union Soc x Soc With EPDM O-rings.

ASTRAL CORZAN™
INDUSTRIAL PIPING SYSTEMS

VALVES

- **BALL VALVES**
  - TRUE UNION 2000 INDUSTRIAL
  - TRUE UNION 2000 BALL CHECK VALVES
  - TRUE UNION 2000 STANDARD
  - TRUE UNION
  - TRUE UNION BALL CHECK VALVES
  - COMPACT
  - SINGLE ENTERY
  - ACCESSORIES
- **NEEDLE VALVES**
- **GATE VALVES**
- **GLOBE VALVES**
- **BUTTERFLY VALVES**
  - ACCESSORIES
- **DIAPHRAGM VALVES**
- **Y-STRAINERS**
- **BASKET STRAINERS**

INTRODUCTION TO SPEARS VALVES

For over a quarter of a century, Spears Manufacturing Company has developed high quality thermoplastic piping system components to better meet industry needs. Spears thermoplastic valves have been developed through years of product improvement testing, combined with the latest in computer aided engineering and manufacturing technology. Today, Spears valves are recognized for their quality, reliability and long service life. Backed by the best in customer service and product availability, Spears valves are the first choice for use in a wide variety of applications, including industrial & chemical Processing, Turf & Irrigation, ppol & spa, and numerous Original Equipment Manufacture products.

Valve Function Basics

Ball Valves

Ball valves derive their name from the on/off function accomplished by means of a flow controlling ball located in the centre of the valve body. A hole through the center of the ball (valve bore) connects the inlet and outlet sides of the valve for fluid stream transfer. The ball rotates 90^{o} on an axis perpendicular to the fluid stream in order to block flow in the off position. The ball is held in place between two Teflon valve seats which serve as a “bubble tight” seal off, while providing lubrication during valve operation. Elastomer o-rings are used in the stem and seal carrier to prevent fluid leakage. Pressure drop is virtually eliminated in the full-open position, since the valve bore is the same size as Schedule 80 system piping.

Check Valves

Check valves prevent reversal of fluid transmission from a designated flow direction. A check-ball is positioned in the center of the valve body, between the inlet and outlet, so that the fluid stream is easily transmitted in the direction of flow, but is allowed to move against the valve seat in the event of flow in the reverse direction. Reversed flow is stopped, or held in “check”, by fluid back-flow pressure which seats the ball against the end of the valve body. Elastomer o-rings provide a positive seal-off. Spears Check Valves have been carefully engineered to minimize pressure drop in their full-flow position, and can be installed in both vertical and horizontal positions.

Gate Valves

Gate valves perform an on/off function accomplished by means of a flow controlling gate centered in the valve body between the intel and outlet sides of the valve. The gate moves along a vertical stem axis, perpendicular to the fluid stream, thereby blocking the flow in the closed position and variably increasing the flow as the gate is moved to the full open position. Spears gate valves use a special wedge-shaped gate and sealing surface design for positive shut off when engaged with the valve body in the closed position. The non-rising type stem provides vertical movement of the gate with out extension of the stem above the valve body.

Butterfly Valves

Butterfly valves are rotary valves in which a disc is rotated 90^{o} to open or close the flow passage. In the full closed position, the disc seals against an elastomer seat. Flow control can be accomplished by varying the degree in which the disc is opened. Spears Butterfly Valves utilize a special offset disc and low contact seat design to minimize operation torque and improve sealing capabilities.

Diaphragm Valves

Diaphragm Valves utilize a moveable elastomeric membrane, or “diaphragm”, to constrict the flow passage through the valve, thereby controlling or throttling fluid flow. The diaphragm additionally isolates system fluids from internal moving parts of the valve. In the Weir-Type design, a raised area in the center of the waterway serves as a seal-off point for the elastomeric diaphragm. When installed in a horizontal position, this additionally facilitates drainage of fluid from the valve. From the full-open position, operation of the valve is accomplished by rotating the handle to vertically move a compressor unit on a threaded shaft. This compresses the attached elastomeric diaphragm to constrict the waterway and finally seal-off flow. Spears diaphragm valves provide an indicator in the center of the handle for 360^{o} visibility of valve position, and a special stop on the compressor to prevent damage from over-tightening.

Spears Thermoplastic piping System Materials

Benefits of Spears

Thermoplastic System Materials

Unlike metal, plastics never rust, scale, or pit - they virtually last forever. Thermoplastics are abrasion resistant, chemical and corrosion resistant, non-conductive, lightweight, and operate at lower friction-loss levels than metals. Moreover, plastics are non-toxic and environmentally safe. Adding these benefits with ease of installation at substantially lower costs, thermoplastic piping system components are the proven choice for years of maintenance free system operations.

Joining Methods for Spares Thermoplastic Systems

Spears thermoplastic piping system products are designed around primary components manufactured from PVC or CPVC materials and their glass reinforced varieties. These materials can be joined through a variety of methods, including solvent cemented, threaded, flanged and mechanical coupled devices.

Material Considerations in Application and System Design

PVC and CPVC thermoplastic piping system components will give years of trouble free service with proper attention to application and system design. To avoid problems, the following key points must be considered when selecting materials for an application and and in designing a system for their use.

1. **Fluid incompatibility** of certain chemicals, especially petroleum distillates and derivatives, can cause environmental stress cracking in different thermoplastic compounds. Chemical compatibility of all valve or system components, including solvent cements, must be verified before installation. Verification of fluid compatibility is at the discretion of the user.
2. **Temperature-pressure relationships** must be considered. Product pressure ratings are based on use of water mediums at 73°F. In general, product pressure ratings must be de-rated as temperature increases (see Temperature Pressure Table for individual valves).
3. **Expansion and contraction** is greater in thermoplastic systems than in metal systems. As a result design must be flexible to allow for movement.
4. **Extreme heat or cold** where internal fluids may freeze or where temperatures may exceed thermoplastic design limits must be avoided, including consideration of storage locations.
5. **Direct sun exposure** results in high thermal heat absorption, especially in darker color thermoplastic materials. A white water-based exterior latex paint can be applied to reduce heat build-up.
6. **Lower impact resistance** of thermoplastic system components than that of metal systems requires avoidance of sharp, pointed objects in both above and below ground installations, including mounting devices and backfilling operations.
7. **Proper installation** is essential. Special attention must be given to technique and instructions for making solvent cemented connections, threaded connections, flanged connections, and for installation of valves and other individual system components. System design must also take into account support, thrust blocking, transition to different materials and other instllation related factors.
8. **Theraded joints** require several considerations. First, pressure capacities of threaded system components should be de-rated to 50% of the rating for corresponding type and size thermoplastic pipe. *NOTE : Valves have individual pressure ratings and do not require de-rating for threaded connections.* Second, as with interal fluid, certain paste sealants may cause environmental stress cracking in thermoplastic materials, and compatibility should be verified before use. Finally, the leading cause of thread joint failures is from over tightening female thermoplastic threads.
9. **Hydrautic Shock** (water hammer; suege pressure) in thermoplastic piping systems can burst pipe, fittings, and valves. Anticipated surge pressures should be calculated and included in maximum internal pressure ratings of system components (specified "Non-Shock" pressure rating for valves). Safeguards should be incorporated in system design to vent pressures and eliminate entrapped air. Fluid velocities should not exceed a maximum of 5 feet per second in thermoplastic systems.
10. **Non-liquid transport** – *WARNING : Spears Manufacturing Company DOES NOT RECOMMEND the use of thermoplastic piping products for systems to transport or store compressed air or gases, or the testing of thermoplastic piping systems with compressed air or gases in above or below ground locations. The use of Spears products in compressed such products, and their use against our responsibility for damage or impairment from its products, or other consequential or incidental damages caused by misapplication, incorrect assembly, and/or exposure to harmful substances or conditions.*

Individual Materials Overview

Thermoplastics

PVC - Poly Vinyl Chloride

PVC is one of the most specifies thermoplastics for piping syetem components, including valves, fittings, flanges, and many specialty products. PVC has excellent chemical and corrosion resistance to a broad range of fluids including water, deionized water, most mineral acids, bases, salts and paraffinic hydrocarbon solutions. PVC is not recommended for use with chlorinated or aromatic hydrocarbons, esters, or polar solvents such as ketones. Spares' PVC materials conform to ASTM Cell Classification 12454-B (foremerly designated as Type I, Grade 1). The maximum recommended service temperature of PVC products is 140^{o}F (60^{o}C).

Glass Reinforced PVC – Fiberloc®

Fiberloc is a registered trademark of the Geon Co. Fiberloc is a glass fiber reinforced PVC composite material. While maintaining the traditional properties of PVC, Fiberloc increases its strength, stiffness, and dimensional stability from glass fiber reinforcement. The maximum recommended service temperature of Fiberloc products is 140^{o} F (60^{o} C).

CPVC – Chlorinated Poly Vinyl Chloride

Chlorinated PVC is used for higher temperature applications than pvc, especially for handling hot corrosive liquids. With similar chemical and corrosion resistance to PVC, increased chlorine content gives CPVC superior thermal resistance. CPVC is not recommended for use with chlorinated or aromatic hydrocarbons, esters, or ASTM Cell Classification 23447-B (formerly designated as Type IV, Grade I). The maximum recommended service temperature CPVC products is 200^{o} F (93^{o} C).

Glass Reinforced CPVC

This special composite compound has the basic properties of CPVC with additional strength, stiffness, and dimensional stability from glass fiber reinforcement. The maximum recommended service temperature of glass reinforced CPVC products is 200^{o} F (93^{o} C).

PP – Polypropylene

The excellent impact resistance characteristics of polypropylene make this polymer the choice for spears valve handles and numerous value accessories. PP exhibits excellent resistant to most chemical environments.

PTFE / PFA (Teflon®) - Polytetrafluoroethylene / Perfluoroalkoxy Resin

Teflon is a registered trademark E.I. du Pont de Nemours & Co. PTFE is a ram extrusion processed teflon, while PFA is a melt processed teflon. These fluroplastics are virtually invert to most chemical, acids, bases and solvents. With a very low coefficient of friction, teflon compounds are considered self-lubricating. As a result, they are the choice for use in valve seats, bearings, and special product components where low friction characteristics or high chemical resistance is desired. Teflon is servicable to a temperature of 500^{o} F (260^{o} C).

Elastomers

EPR (EPDM) – Ethylene propylene rubber

Used in o-ring seals, EPR is recommended for water, chlorinated water, dilute acids and alkalines, alcohols, and has excellent resistance to ozone. EPR is not recommended for petroleum oils, di-ester lubricants, strong acids, or strong alkalines. The maximum recommended service temperature of EPR is 300^{o} F (149^{o} C).

FPM (Viton®) – Fluocarbon elastomer

Viton is a registered trademark of E. I. du Pont de Nemours & Co. Used in o-ring seals, FPM exhibits a very broad range of chemical resistance, including petroleum oils, di-ester based lubricants, silicate fluids and greases, halogenated hydrocarbons, and mineral acids. FPM is not recommended for ketones, amines, anhydrous ammonia, hot hydrofluoric or chlorosulfonic acids, or automotive brake fluids. The maximum recommended service temperature of FPM is 400^{o} F (204^{o} C).

Nitrile (Buna-N) – Nitrile elastomer

Used in o-ring selas, nitrile elastomers are recommended for petroleum oils and fluids, silicone oils and greases, di-ester based lubricants, ethylene glycol based fluids, and cold water. Nitrile is not recommended for phosphate ester hydraulic fluids, halogenated hydrocarbons, strong acids, ketones, ozone or automotive brake fluids. The maximum recommended service temperature of nitrile is 275^{o} F (135^{o} C).

Metals

SS316 - Type 316 Stainless Steel

Used in special valve components, nuts, and bolts, SS316 is one of the highest chemical and corrosion resistant stainless steels available.

Zinc Plated Steel

Used on many standard hardware components, nuts and bolts to provide good corrosion resistance under most normal operating conditions.

Temperature Pressure De-rating for CPVC Thermoplastic Materials

Elevated temperature fluid mediums require a de-rating of thermoplastic pipe maximum internal pressure ratings at 73° F. To determine the maximum internal pressure rating at an elevated temperature, simply multiply the product pressure rating 73° F by the percentage specified for the desired temperature.

PLEASE NOTE - Valves have different elevated temperature ratings than pipe & fittings. See individual valve recommendations.

Syetem Operating Temperature °F (°C)	73 (23)	80 (27)	90 (32)	100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
CPVC	100%	100%	91%	82%	73%	65%	57%	50%	45%	40%	32%	25%	22%	20%	-0-

Note : Threaded products should not be used at temperatures above 100° F (43° C) for PVC, and 150° F (66°C) for CPVC.

Typical Physical Properties of CPVC Thermoplastic Materials

The following table lists typical physicial properties of PVC and CPVC thermoplastic materials. Variations may exist depending on specific compound and product.

Properties	ASTM Test Method	CPVC
Mechanical Properties, 73° F		
Specific Gravity	D 792	1.55
Tensile Strength, psi	D 638	8,000
Modulus of Elasticity, psi	D 638	360,000
Compressive Strength, psi	D 695	10,100
Flexural Strength, psi	D 790	15,100
Izod Impact, notched, ft-lb/in	D 256	1.5
Thermal Properties		
Heat Deflection Temperature, °F at 66 psi	D 648	217
Thermal Conductivity, BTU/hr/sq ft/°F/in	C 177	.95
Co efficient of Linear Expansion, in/in/°F	D 696	3.4×10^{-5}
Flammability		
Limiting Oxygen Index, %	D 2863	60
UL 94 Rating		V-O. 5VB, 5VA
Other Properties		
Water Absorption, % 24 hrs.	D 570	.03
Industry Standard Color		Medium Gray
ASTM Cell Classification	D 1784	23447-B

Spears Valve Standards

Standards Provide greater assurance of product performance and consistency, and are available to assist design engineers in system specification. The most frequently referenced industry standards for plastic piping systems are ASTM Standard Specifications and Practices. Along with ASTM Standards, additional product specifications and certidications form the basis of product conformance to which speares valves are manufactured.

Individual Standards Overview

ASTM – American Society for Testing and Materials

ASTM D 1784

Specifies compound physical requirements for PVC and CPVC materials used in the manufacture of thermoplastic valves, pipe, and fittings. The standard classifies compounds on the basis of several physical and chemical properties. Conformance to a particular material classification requires meeting the minimum requirements specified.

ASTM D 1785 and F 441

Specifies physical dimensions, test requirements, and maximum operating pressures, for Schedule 40, 80 and 120 PVC (D 1785) and CPVC (F 441) pressure pipe.

ASTM D 2464 and F 437

Specifies physical dimensions, test requirements, and workmanship for threaded Schedule 80 PVC (D 2464) and CPVC (F 437) pressure fittings.

ASTM D 2564. F 493, and 656

Specifies requirements for PVC (D 2564) and CPVC (F 493) solvent cement, including component compounds, minimum resin content , viscosity, and physical performance. Standard F 656 specifies requirements for primers to be used with PVC solvent cements.

ASTM D 2855

Specifies standard practice and procedures for making PVC pipe and fitting joints with solvent cement.

ASTM D 4101

Specifies classification of injection molding and extrusion grades of Polypropylene (PP) materials according to physical characteristics.

ASTM F 1498

Specifies dimensions and gauging of tapered pipe threads on plastic pipe and fittings.

ANSI - American National Standards Institute

ANSI B1.20.1

Specifies basic thread form, taper, and tolerances of general purpose tapered pipe threads (metal).

ANSI B1.20.1

Specifies standard bolt hole patterns and basic dimensions for Class 150 steel pipe flanges.

NSF – National Sanitation Foundation

NSF is a third product approval agency which tests manufacture's product against a variety of health and product performance standards. They are one of the most recognised agencies for issuing approval of plastic piping system products for potable water use.

NSF Standard 14

Certifies product suitability for potable water use, product conformance to applicable ASTM standards, and establishes minimum requirements for manufacturer's quality control programs through routine testing and facilities inspections.

NSF Standard 14 Special Engineering

Appurtenance Program (S.E.)

In addition to Standard 14 General requirements, the S.F. program establishes product performance requirements where no directly applicable ASTM specifications exist. NSF S.E. Specifications are developed from a combination of applicable portions of ASTM specifications and manufacturer's design specifications as a standard for conformance verification.

NSF Standard 61

Developed to establish minimum requirements for the control of potential adverse health effects from products in contact with drinking water. The primary focus of this standard is on contaminates or impurities which may be imparted indirectly to drinking water through toxicological testing. While this standard does not address product performance criteria, conformance to Standard 61 is a prerequisite to NSF Standard 14 certification.

TRUE UNION 2000 BALL VALVES

One of the Most Versatile, Compact Valve Designs Available

Spears® True Union 2000 Ball Valves, 3-Way Ball Valves and Ball Check Valves provide maximum versatility with fully interchangeable valve cartridges. Provides for easier system design modifications and upgrades in multiphase projects, or anywhere changes in valve types are desired. Simply exchange any True Union 2000 valve in-line using existing union nuts. Also mates with Spears® new 2000 Pipe Unions. All True Union 2000 valves feature a low profile, compact design for minimal space requirements. Additionally, Spears® offers valve Retrofit Kits for easy in-line replacement of other valves and factory installed Actuation Packages.

True Union 2000
Industrial Ball Valve

True Union 2000
Industrial Ball Check Valve

True Union 2000
Standard Ball Valve

TRUE UNION 2000 INDUSTRIAL BALL VALVES

Features … PVC, CPVC

This multi-featured, space saving quarter-turn shutoff valve is designed to meet the demands of today's industrial and chemical processing applications. PVC and CPVC valves are available in IPS sizes 1/2" through 6" with socket/regular thread, SR (Special Reinforced) thread, flanged or spigot end connectors and 8" Venturied valve with socket or flanged ends. Also available in metric socket and BSP thread sizes 1/2" through 2".

- € Chemical & Corrosion Resistant PVC or CPVC Construction
- € Also Available in **Spears® LXT**' High Purity , Low Extractable PVC Material
- € Interchangeable with all True Union 2000 Valves Mates with Union 2000 Pipe Unions
- € High Impact Polypropylene Handle
- € Built-in Handle Lockout
- € Schedule 80 Full-Bore Design
- € Strong, Buttress Thread Union Nuts
- € Spears® Double O-ring Safe-T-Shear® Stem Design
- € EPDM or Viton® O-rings
- € Spears® Safe-T-Blocked® Seal Carrier
- € Self Adjusting PTFE Floating Seat Design
- € Fully Serviceable, Replaceable Components
- € Sizes 1/2" - 2" pressure rated to 235 psi @ 73°F. Sizes 2-1/2" - 6", 8" Venturied and all Flanged to 150 psi @ 73°F.
- € NSF Certified for Potable Water use
- € Suitable for Vacuum Service
- € Assembled with Silicone-Free, Water Soluble Lubricants
- € Manufactured to ASTM F 1970

Sample Engineering Specification

All thermoplastic ball valves shall be True Union 2000 Industrial type manufactured to ASTM F 1970 and constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D1784 Cell Classification 23447. All O-rings shall be EPDM or Viton®. All valves shall have Safe-T-Shear® stem with double O-ring stem seals. All valve handles shall be polypropylene with built-in lockout mechanism. All valve union nuts shall have Buttress threads. All seal carriers shall be Safe-T-Blocked®. All valve components shall be replaceable. All valves shall be certified by NSF International for use in potable water service. All 1/2" through 2" valves shall be pressure rated to 235 psi, all 2-1/2" through 6", 8" Venturied and all flanged valves shall be pressure rated to 150 psi for water at 73°F.

Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Part Number [1]					Pressure Rating
		Socket	Threaded	SR Threaded	Flanged	Spigot	
1/2	EPDM	1829-005	included	1821-005SR	1823-005	1827-005	235 psi Non-Shock Water @ 73°F (Flanged 150 psi Non-Shock) Water @ 73°F
	Viton®	1839-005	included	1831-005SR	1833-005	1837-005	
3/4	EPDM	1829-007	included	1821-007SR	1823-007	1827-007	
	Viton®	1839-007	included	1831-007SR	1833-007	1837-007	
1	EPDM	1829-010	included	1821-010SR	1823-010	1827-010	
	Viton®	1839-010	included	1831-010SR	1833-010	1837-010	
1-1/4	EPDM	1829-012	included	1821-012SR	1823-012	1827-012	
	Viton®	1839-012	included	1831-012SR	1833-012	1837-012	
1-1/2	EPDM	1829-015	included	1821-015SR	1823-015	1827-015	
	Viton®	1839-015	included	1831-015SR	1833-015	1837-015	
2	EPDM	1829-020	included	1821-020SR	1823-020	1827-020	
	Viton®	1839-020	included	1831-020SR	1833-020	1837-020	
2-1/2	EPDM	1822-025	1821-025	1821-025SR	1823-025	1827-025	150 psi Non-Shock Water @ 73°F
	Viton®	1832-025	1831-025	1831-025SR	1833-025	1837-025	
3	EPDM	1822-030	1821-030	1821-030SR	1823-030	1827-030	
	Viton®	1832-030	1831-030	1831-030SR	1833-030	1837-030	
4	EPDM	1822-040	1821-040	1821-040SR	1823-040	1827-040	
	Viton®	1832-040	1831-040	1831-040SR	1833-040	1837-040	
6	EPDM	1822-060	1821-060	1821-060SR	1823-060	1827-060	
	Viton®	1832-060	1831-060	1831-060SR	1833-060	1837-060	
8[3]	EPDM	1822-080	„	„	1823-080	„	
	Viton®	1832-080	„	„	1833-080	„	

1) For CPVC, add the letter "C" following the size code of part number listed (e.g.,1829-005**C**, 1821-005**C**SR)
2) For Special Ball Vent Design, add the letter "V" before the dash separator (e.g.,1829**V**-005, 1821**V**-005CSR)
3) 8" Venturied Valves are 6" ball valves fitted with 6x8 end connector adapters.

Optional Vented Ball Valves

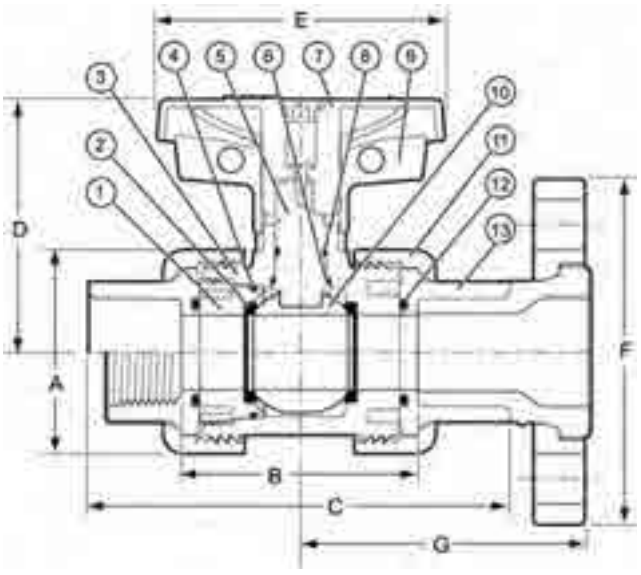
Same valve with special ball vent design for sodium hypochlorite (bleach) and other chemical applications where entrapped fluids may form caustic crystalline residues and pressure build up from gases developed. Valve has a 1/8" vent hole in ball to equalize internal fluid pressures. Install valve with ball vent on the pressure (upstream) side when in closed position.

Optional Accessories*

- € Retro-Fit End Connector Sets for Valve Replacement
- € Split-Nut Repair Kits for Union Nut Replacement
- € Supplemental End Connectors
- € Round Safety Handles
- € Handle Lockout Ring
- € Stem Extension Kits
- € Square Operator Nuts
- € Multi Mount Valve/Actuation Mounting Kits

* See "***BALL VALVE ACCESSORIES***" section for details of individual products.

TRUE UNION 2000 INDUSTRIAL BALL VALVES



Replacement Parts

No.	Component	Qty.	Material
1	Seal Carrier	1	PVC/CPVC
2	Seat	2	PTFE
3	Body	1	PVC/CPVC
4	Carrier O-ring	1	EPDM/Viton®
5	Stem	1	PVC/CPVC
6	Stem Bearing	1	PP
7	Handle	1	PP
8	Stem O-ring	2	EPDM/Viton®
9	Handle Lock	1	PP
10	Ball	1	PVC/CPVC
11	Union Nut	2	PVC/CPVC
12	End Connector O-ring	2	EPDM/Viton®
13	End Connector	2	PVC/CPVC

Dimensions, Weights, Operating Torque & C_V Values

Nominal Size	Dimensions Reference (inches, ± 1/16)										Approx. Wt. (Lbs.)		Oper.[2] Torque (in. lbs.)	C_V[3] Values		
	A	B[1]		C			D	E	F	G	PVC	CPVC		Soc/Thd	Flanged	Spigot
		Soc/Thd	Spigot	Socket	Thread	Spigot										
1/2	1-7/8	2-3/8	2-7/8	4-3/16	3-3/16	4-5/8	2-9/16	2-13/16	3-1/2	2-31/32	.36	.38	16	29	18	27
3/4	2-1/4	2-3/4	3-1/4	4-3/4	4-1/4	5-1/4	2-7/8	3-3/8	3-7/8	3-5/16	.56	.58	17	63	39	57
1	2-1/2	2-7/8	3-1/2	5-1/8	4-11/16	5-3/4	3-1/8	3-7/16	4-1/2	3-5/8	.74	.77	22	120	73	108
1-1/4	3-1/16	3-1/4	3-13/16	5-3/4	5-3/16	6-5/16	3-5/8	3-7/8	4-5/8	3-31/32	1.13	1.19	28	243	151	223
1-1/2	3-1/2	3-1/2	4	6-1/4	5-7/16	6-3/4	4	4-3/16	5	4-3/8	1.54	1.60	61	357	223	333
2	4-1/4	4-3/4	5-3/16	7-3/4	6-3/4	8-1/4	4-1/2	5-1/8	6	5-1/4	2.72	2.85	77	599	395	571
2-1/2	5-3/8	6-7/8	7-13/16	10-7/16	9-11/16	11-3/8	5-1/8	6-1/4	7-1/2	6	7.42	7.70	132	856	579	734
3	6-3/16	7	7-13/16	10-11/16	9-7/8	11-9/16	5-7/8	7-5/8	7-1/2	6-13/16	7.46	7.81	132	1416	974	1322
4	7-5/8	7-5/16	8-1/4	11-7/8	10-1/4	12-3/4	6-3/4	9-3/16	9	7-1/2	12.35	12.48	396	2865	1952	2672
6	11-5/8	11-1/16	13	17-1/16	15-3/4	18-1/2	8-1/8	14-5/16	11-1/4	10-3/16	37.53	40.55	732	6638	4824	6149
8[4]	11-5/8	23-3/16	—	31-7/8	—	—	8-1/8	14-5/16	13-1/2	17-13/16	50.84	55.92	732	N/A	N/A	N/A

1: Valve Lay Length
2: Torque required at valve maximum internal pressure rating, 5ft/sec. Flow velocity; due to adjustment differences during installation, actual valves may vary.
3: Gallons per minute at 1 psi pressure drop. Valves calculated from laying length, based on derivative of Hazen-Williams equation with surface roughness factor of C=150.
4: 8" Venturied Valves are 6" ball valves fitted with 6x8 end connector adapters.

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	2-1/2" - 8"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

NOTE: Flanged Valves have a base pressure rating of 150 psi.

NOT FOR USE WITH COMPRESSED AIR OR GASES

TRUE UNION 2000 INDUSTRIAL BALL CHECK VALVES

Features … PVC, CPVC

Flow tested design provides quick response with positive seal for prevention of system back flow in industrial and chemical processing applications. Valves are available in IPS sizes 1/2" through 6" with socket/regular thread, SR threaded (Special Reinforced), flanged or spigot end connectors and 8" venturied valve with socket or flanged ends.. Also available in metric socket and BSP thread sizes 1/2" through 2".

- € Chemical & Corrosion Resistant PVC or CPVC Construction
- € Also Available in Spears® LXT' High Purity,Low Extractable PVC Material
- € Strong, Buttress Thread Union Nuts
- € Spears® Safe-T-Blocked® Seal Carrier
- € Uses Standard O-ring Seat
- € EPDM or Viton® O-rings
- € Fully Serviceable, Replaceable Components
- € Sizes 1/2" - 2" Pressure Rated to 235 psi @ 73°F, Sizes 2-1/2" - 6", 8" Venturied and all Flanged Pressure Rated to 150 psi @ 73°F
- € Suitable for Either Horizontal or Vertical Installations
- € NSF Certified for Potable Water use
- € Suitable for Vacuum Service
- € Assembled with Silicone-Free, Water Soluble Lubricants
- € Manufactured to ASTM F 1970

Sample Engineering Specification

All thermoplastic check valves shall be True Union 2000 Industrial Ball Check type manufactured to ASTM F 1970 and constructed from PVC Type I, ASTM D 1784, Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be EPDM or Viton®. All valve union nuts shall have Buttress threads. All valve seats shall be a standard O-ring type. All seal carriers shall be Safe-T-Blocked®. All valve components shall be replaceable. All valves shall be listed by NSF for use in potable water service. All valves shall be certified by NSF International for use in potable water service. All PVC and CPVC 1/2" through 2" valves shall be pressure rated to 235 psi, all 2-1/2" through 6", 8" Venturied and all flanged valves shall be pressure rated to 150 psi for water at 73°F as manufactured by Spears® Manufacturing Company.

Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Part Number[1]					Pressure Rating
		Socket	Threaded	SR Threaded	Flanged	Spigot	
1/2	EPDM	4529-005	included	4521-005SR	4523-005	4527-005	235 psi Non-Shock Water @ 73°F (Flanged 150 psi Non-Shock) Water @ 73°F
	Viton®	4539-005	included	4531-005SR	4533-005	4537-005	
3/4	EPDM	4529-007	included	4521-007SR	4523-007	4527-007	
	Viton®	4539-007	included	4531-007SR	4533-007	4537-007	
1	EPDM	4529-010	included	4521-010SR	4523-010	4527-010	
	Viton®	4539-010	included	4531-010SR	4533-010	4537-010	
1-1/4	EPDM	4529-012	included	4521-012SR	4523-012	4527-012	
	Viton®	4539-012	included	4531-012SR	4533-012	4537-012	
1-1/2	EPDM	4529-015	included	4521-015SR	4523-015	4527-015	
	Viton®	4539-015	included	4531-015SR	4533-015	4537-015	
2	EPDM	4529-020	included	4521-020SR	4523-020	4527-020	
	Viton®	4539-020	included	4531-020SR	4533-020	4537-020	
2-1/2	EPDM	4522-025	4521-025	4521-025SR	4523-025	4527-025	150 psi Non-Shock Water @ 73°F
	Viton®	4532-025	4531-025	4531-025SR	4533-025	4537-025	
3	EPDM	4522-030	4521-030	4521-030SR	4523-030	4527-030	
	Viton®	4532-030	4531-030	4531-030SR	4533-030	4537-030	
4	EPDM	4522-040	4521-040	4521-040SR	4523-040	4527-040	
	Viton®	4532-040	4531-040	4531-040SR	4533-040	4537-040	
6	EPDM	4522-060	4521-060	4521-060SR	4523-060	4527-060	
	Viton®	4532-060	4531-060	4531-060SR	4533-060	4537-060	
8[2]	EPDM	4522-080	„	„	4523-080	„	
	Viton®	4532-080	„	„	4533-080	„	

1: For CPVC valve, add the letter "C" to the part number (e.g., 4529-005**C**, 4521-005**C**SR)
2: 8" Venturied Valves are 6" ball valves fitted with 6x8 end connector adapters

Optional Accessories*

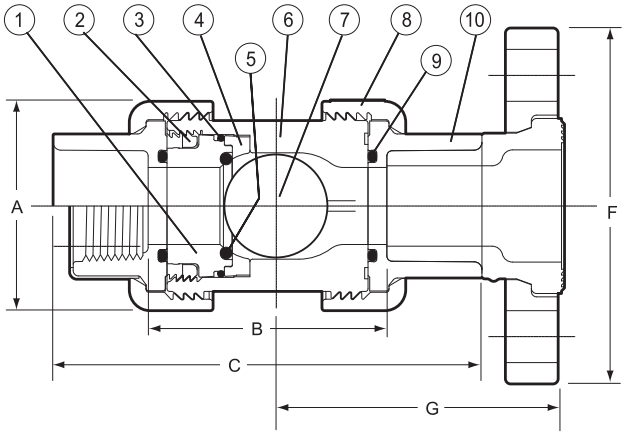
- € Retro-Fit End Connector Sets for Valve Replacement
- € Split-Nut Repair Kits for Union Nut Replacement
- € Supplemental End Connectors

* See ***BALL VALVE ACCESSORIES*** section for details of individual products.

Ball Check Foot Valves

Spears® Ball Check Valves easily convert to foot valves utilizing optional Foot Valve Screen adapters found in Ball Valve Accessories section.

TRUE UNION 2000 INDUSTRIAL BALL CHECK VALVES



Replacement Parts

No.	Component	Qty.	Material
1	Seal Carrier	1	PVC/CPVC
2	Seal Carrier Nut	1	PVC/CPVC
3	Carrier O-ring	1	EPDM/Viton®
4	Seat Plate	1	PVC/CPVC
5	Seat O-ring	1	EPDM/Viton®
6	Body	1	PVC/CPVC
7	Ball	1	PVC/CPVC
8	Union Nut	2	PVC/CPVC
9	End Connector O-ring	2	EPDM/Viton®
10	End Connector	2	PVC/CPVC

Dimensions, Weights, & C_V Values

Nominal Size	Dimensions Reference (inches, ± 1/16)								Approx. Wt. (Lbs.)		Cv^2 Values			Horizontal Closing	
	A	B[1]		C			F	G	PVC	CPVC	Soc/Thd	Flange	Spigot	Feet of Head (water)	GPM (minimum)
		Soc/Thd	Spigot	Socket	Thread	Spigot									
1/2	1-7/8	2-7/16	2-7/8	4-3/16	3-13/16	4-5/8	3-1/2	2-31/32	.30	.33	6.3	6	6.3	1.6	.10
3/4	2-1/4	2-3/4	3-1/4	4-3/4	4-1/4	5-1/4	3-7/8	3-5/16	.46	.50	17	16	17	1.6	.10
1	2-1/2	2-7/8	3-1/2	5-1/8	4-11/16	5-3/4	4-1/4	3-5/8	.70	.74	25	24	25	1.6	.25
1-1/4	3-1/16	3-1/4	3-3/16	5-3/4	5-3/16	6-5/16	4-5/8	3-31/32	1.04	1.09	65	61	65	1.6	.40
1-1/2	3-1/2	3-1/2	4	6-1/4	5-7/16	6-3/4	5	4-3/8	1.37	1.45	86	82	86	1.6	.75
2	4-1/4	4-3/4	5-3/16	7-3/4	6-3/4	8-1/4	6	5-1/4	2.47	2.62	130	125	130	1.6	.75
2-1/2	6-3/16	5-7/8	7-13/16	9-5/16	8-1/2	11-3/8	7-1/2	6	6.80	7.25	200	193	200	1.0	1.50
3	6-3/16	6-7/8	7-13/16	10-11/16	9-3/4	11-9/16	7-1/2	6-13/16	6.98	7.35	275	268	275	1.0	4.00
4	7-1/2	7-1/4	8-1/4	11-13/16	10-1/4	12-3/4	9	7-1/2	12.13	12 .96	500	489	500	1.0	5.50
6	11-5/8	11-1/6	13	17-1/16	15-3/4	18-1/2	11-1/4	10-3/16	37.07	39.98	800	794	800	N/A	N/A
8[3]	11-5/8	23-3/16	—	31-7/8	—	—	13-1/2	17-13/16	50.84	55.92	N/A	N/A	N/A	N/A	N/A

1: Valve Lay Length
2: Gallons per minute at 1 psi pressure drop. Valves calculated from laying length, based on derivative of Hazen-Williams equation with surface roughness factor of C=150.
3: 8" Venturied Valves are 6" ball valves fitted with 6x8 end connector adapters

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	2-1/2" - 8"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

NOTE: Flanged valves have a base pressure rating of 150 psi

General Installation Information: Ball check valves may be installed in either horizontal or vertical position. A minimum of ten (10) pipe diameters distance maintained from any pump or other source of turbulence. Check valves **MUST** be installed with the valves **FLOW** arrow pointing in the direction of flow.

NOT FOR USE WITH COMPRESSED AIR OR GASES

TRUE UNION 2000 STANDARD BALL VALVES

Features … PVC, CPVC

Economical, low profile quarter-turn shutoff valve is excellent for general purpose and many O.E.M applications. PVC and CPVC valves are available in IPS sizes 1/2" through 4" with socket, regular thread, SR threaded (Special Reinforced), flanged or spigot end connectors.

- € Chemical & Corrosion Resistant PVC or CPVC Construction
- € Interchangeable with all True Union 2000 Valves, Mates with Union 2000 Pipe Unions
- € High Impact Polypropylene Handle
- € Schedule 80 Full-Bore Design
- € Strong, Buttress Thread Union Nuts
- € Spears® Single O-ring Safe-T-Shear® Stem Design
- € Spears® Safe-T-Blocked® Seal Carrier
- € Replaceable Teflon® HDPE Floating Seat Design
- € EPDM or Viton® O-rings
- € Sizes 1/2" - 2" pressure rated to 235 psi @ 73°F
- € Sizes 2-1/2" - 4" and all flanged pressure rated to 150 psi @ 73°F
- € NSF Certified for Potable Water use
- € Suitable for Vacuum Service
- € Assembled with Silicone-Free, Water Soluble Lubricants
- € Manufactured to ASTM F 1970

Sample Engineering Specification

All thermoplastic ball valves shall be True Union 2000 Standard type manufactured to ASTM F 1970 and constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be EPDM or Viton®. All valves shall have Safe-T-Shear® stem with O-ring stem seal. All handles shall be polypropylene. All union nuts shall have Buttress threads. All seal carriers shall be Safe-T-Blocked®. All valves shall be certified by NSF International for use with potable water. All 1/2" - 2" valves shall be pressure rated to 235 psi, all 2-1/2" - 4" and all flanged valves to 150 psi for water @ 73°F, as manufactured by Spears® Manufacturing Company.

Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Part Number[1]					Pressure Rating
		Socket	Threaded	SR Threaded	Flanged	Spigot	
1/2	EPDM	3629-005	included	3621-005SR	3623-005	3627-005	235 psi Non-Shock Water @ 73°F (Flanged 150 psi Non-Shock) Water @ 73°F
	Viton®	3639-005	included	3631-005SR	3633-005	3637-005	
3/4	EPDM	3629-007	included	3621-007SR	3623-007	3627-007	
	Viton®	3639-007	included	3631-007SR	3633-007	3637-007	
1	EPDM	3629-010	included	3621-010SR	3623-010	3627-010	
	Viton®	3639-010	included	3631-010SR	3633-010	3637-010	
1-1/4	EPDM	3629-012	included	3621-012SR	3623-012	3627-012	
	Viton®	3639-012	included	3631-012SR	3633-012	3637-012	
1-1/2	EPDM	3629-015	included	3621-015SR	3623-015	3627-015	
	Viton®	3639-015	included	3631-015SR	3633-015	3637-015	
2	EPDM	3629-020	included	3621-020SR	3623-020	3627-020	
	Viton®	3639-020	included	3631-020SR	3633-020	3637-020	
2-1/2	EPDM	3622-025	3621-025	3621-025SR	3623-025	3627-025	150 psi Non-Shock Water @ 73°F
	Viton®	3632-025	3631-025	3631-025SR	3633-025	3637-025	
3	EPDM	3622-030	3621-030	3621-030SR	3623-030	3627-030	
	Viton®	3632-030	3631-030	3631-030SR	3633-030	3637-030	
4	EPDM	3622-040	3621-040	3621-040SR	3623-040	3627-040	
	Viton®	3632-040	3631-040	3631-040SR	3633-040	3637-040	

1: For CPVC valve, add the letter "C" to the part number (e.g., 3629-005**C**, 3621-005**C**SR)

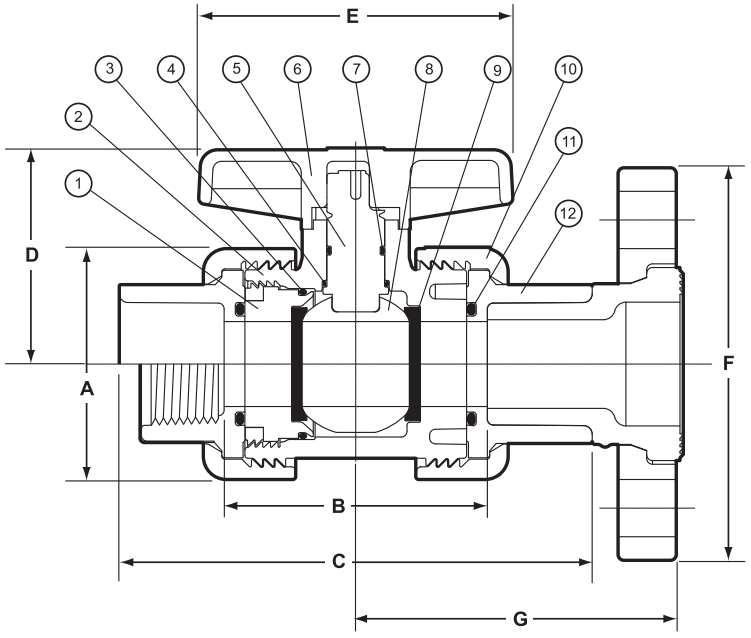
Optional Accessories*

- €Retro-Fit End Connector Sets for Valve Replacement
- €Split-Nut Repair Kits for Union Nut Replacement
- €Supplemental End Connectors
- €Round Safety Handles
- €Stem Extension Kits
- €Square Operator Nuts
- €Multi Mount Valve/ Actuation Mounting Kits
- €Mini-Mount Actuation Mounting Kits

* See □***BALL VALVE ACCESSORIESŽ*** section for details of individual products.

NOT FOR USE WITH COMPRESSED AIR OR GASES

TRUE UNION 2000 STANDARD BALL VALVES



Replacement Parts

No.	Component	Qty.	Material
1	Seal Carrier	1	PVC/CPVC
2	Body	1	PVC/CPVC
3	Carrier O-ring	1	EPDM/Viton®
4	Stem Bearing [1,2]	1	PP
5	Stem 1		PVC/CPVC
6	Handle	1	PP
7	Stem O-ring	1	EPDM/Viton®
8	Ball	1	PVC/CPVC
9	Seat	2	Teflon® HDPE
10	Union Nut	2	PVC/CPVC
11	End Connector O-ring	2	EPDM/Viton®
12	End Connector	2	PVC/CPVC

1: O-Ring up to 2"
2: Teflon® Thrust Bearing: 2½", 3" & 4"

Dimensions, Weights, Operating Torque & Cv Values

Nominal Size	A	B[1]		C			D	E	F	G	Approx. Wt. (Lbs.)		Oper.[2] Torque (in. lbs.)	Cv Values[3]	
		Soc/Thd	Spigot	Socket	Thread	Spigot					PVC	CPVC		Soc/Thd/Spig	Flanged
1/2	1-7/8	2-7/16	2-7/8	4-3/16	3-13/16	4-5/8	1-5/8	2-1/2	3-1/2	2-31/32	.33	.35	12	29	18
3/4	2-1/4	2-3/4	3-1/4	4-3/4	4-1/4	5-1/4	2	3	3-7/8	3-5/16	.51	.54	20	63	39
1	2-1/2	2-7/8	3-1/2	5-1/8	4-11/16	5-3/4	2-5/16	3-7/16	4-1/4	3-5/8	.71	.75	25	120	73
1-1/4	3-1/16	3-1/4	3-13/16	5-3/4	5-3/16	6-5/16	2-13/16	3-9/16	4-5/8	3-31/32	1.12	1.17	35	243	151
1-1/2	3-1/2	3-1/2	4	6-1/4	5-7/16	6-3/4	3-1/16	3-7/8	5	4-3/8	1.47	1.53	45	357	223
2	4-1/4	4-3/4	5-13/16	7-3/4	6-3/4	8-1/4	3-3/4	5	6	5-1/4	2.62	2.75	94	599	395
2-1/2	6-3/16	7	7-13/16	10-1/2	8-1/2	11-3/8	5-7/8	7-5/8	7	6	7.42	7.70	120	856	579
3	6-3/16	7	7-13/16	10-11/16	9-3/4	11-9/16	5-7/8	7-5/8	7-1/2	6-13/16	7.46	7.81	120	1416	974
4	7-5/8	7-1/2	8-1/4	12-1/16	10-1/4	12-3/4	6-3/4	6-3/4	9-1/16	7-1/2	12.35	12.48	336	2865	1952

1: Valve Lay Length
2: Torque required at valve maximum internal pressure rating, 5ft/sec. Flow velocity; due to adjustment differences during installation, actual valves may vary.
3: Gallons per minute at 1 psi pressure drop. Valves calculated from laying length, based on derivative of Hazen-Williams equation with surface roughness factor of C=150.

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	2-1/2" - 4"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

NOT FOR USE WITH COMPRESSED AIR OR GASES

TRUE UNION BALL VALVES
(REGULAR STYLE)

Sample Engineering Specification

All thermoplastic ball valves shall be True Union type constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be EPDM or Viton®. All valves shall have Safe-T-Shear® stem and double stop Polypropylene handle. All valve union nuts shall have Buttress threads. All seal carriers shall be Safe-T-Blocked®. All valve components shall be replaceable. All valves shall be certified by NSF International for use in potable water service. All 1/2" - 2" valves shall be pressure rated at 235 psi and all 2-1/2" - 6" and all flanged valves shall be pressure rated at 150 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.

Features … PVC, CPVC

This versatile, quarter-turn shutoff valve is well suited for industrial and chemical processing applications. Available in IPS Sizes 1/2"- 4" with socket, threaded or flanged end connectors. 6" Venturied valve (4" valve with 4 x 6 adapter) available with either socket or flanged end connection. Also available with metric 20mm - 110mm or 1/2" - 4" BSP threaded end connectors.

- € Chemical & Corrosion Resistant PVC or CPVC Construction
- € Schedule 80 Full-Bore Design
- € Strong, Buttress Thread Union Nuts
- € Fully Serviceable, Replaceable Components
- € Spears® Safe-T-Blocked® Seal Carrier
- € Self Adjusting PTFE Floating Seat Design
- € EPDM or Viton® O-rings
- € High Impact Polypropylene Handle
- € Spears® Safe-T-Shear® Stem Design
- € Sizes 1/2" - 2" Pressure Rated to 235 psi @ 73°F, Sizes 2-1/2" - 6" and all flanged Pressure Rated to 150 psi @ 73°F
- € NSF Certified for Potable Water use
- € Suitable for Vacuum Service
- € Assembled with Silicone-Free, Water Soluble Lubricants
- € Manufactured to ASTM F 1970

Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Part Number[1]			Pressure Rating
		Threaded	Socket	Flanged	
1/2	EPDM	2329-005	included	2323-005	235 psi Non-Shock Water @ 73°F (Flanged 150 psi Non-Shock) Water @ 73°F
	Viton®	2339-005	included	2333-005	
3/4	EPDM	2329-007	included	2323-007	
	Viton®	2339-007	included	2333-007	
1	EPDM	2329-010	included	2323-010	
	Viton®	2339-010	included	2333-010	
1-1/4	EPDM	2329-012	included	2323-012	
	Viton®	2339-012	included	2333-012	
1-1/2	EPDM	2329-015	included	2323-015	
	Viton®	2339-015	included	2333-015	
2	EPDM	2329-020	included	2323-020	
	Viton®	2339-020	included	2333-020	
2-1/2	EPDM	2321-025	2322-025	2323-025	150 psi Non-Shock Water @ 73°F
	Viton®	2331-025	2332-025	2333-025	
3	EPDM	2321-030	2322-030	2323-030	
	Viton®	2331-030	2332-030	2333-030	
4	EPDM	2321-040	2322-040	2323-040	
	Viton®	2331-040	2332-040	2333-040	
6[2] venturied	EPDM	---	2322-060	2323-060	
	Viton®	---	2332-060	2333-060	

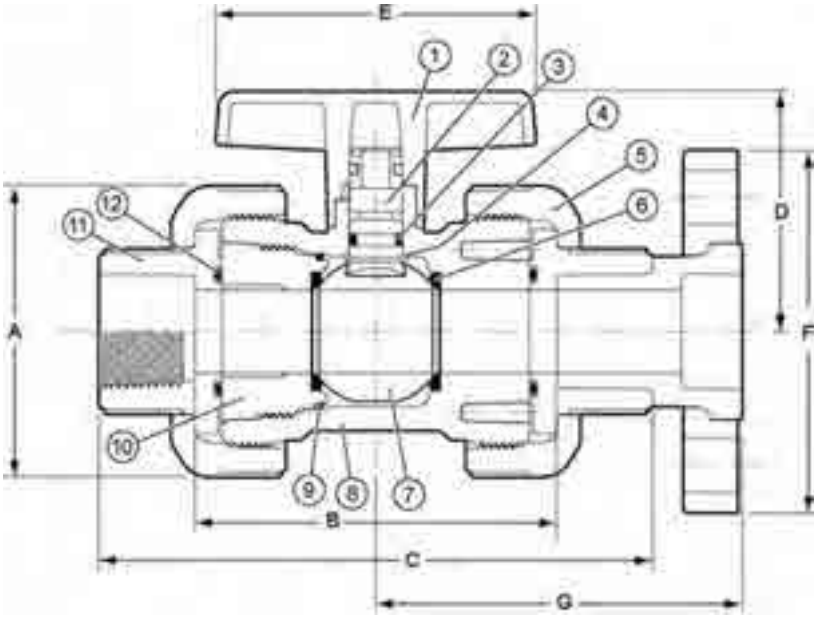
1: For CPVC valves, add the letter "CŽ to part numbers listed (e.g., 2339-006).
2: Consists of 4" True Union Ball Valve with two 4" x 6" Adapters.

Optional Accessories*

- € Round Safety Handle
- € Stem Extension Kit
- € Multi-Mount Valve/Actuation
- € Mounting Bracket & Kits
  Mini-Mount Actuation
  Mounting Kit
- € 2" Square / T-Style
  Operator Nut

* See "***BALL VALVE ACCESSORIES***Ž section for details of individual products.

TRUE UNION BALL VALVES
(REGULAR STYLE)



Replacement Parts

No.	Component	Qty.	Material
1	Handle	1	PP
2	Stem	1	PVC/CPVC
3	Stem O-ring	1	EPDM/Viton®
4	Stem Bearing*	1	PP
5	Union Nut	2	PVC/CPVC
6	Seat**	2	PTFE
7	Ball	1	PVC/CPVC
8	Body	1	PVC/CPVC
9	Carrier O-ring	1	EPDM/Viton®
10	Seal Carrier	1	PVC/CPVC
11	End Connector	2	PVC/CPVC
12	End Connector O-ring	2	EPDM/Viton®

* Sizes 1-1/4" and larger.

** Seat O-ring (not shown) on sizes 2-1/2" and larger.

Dimensions, Weights, Operating Torque & C_V Values

Nominal Size	Dimension Reference (inches, ± 1/16)							Approx. Wt. (Lbs.)				Oper.[2] Torque (in.-lb.)	C_V[4] Values	
								PVC		CPVC				
	A	B[1]	C	D	E	F	G	Soc/Thd	Flanged	Soc/Thd	Flanged		Soc/Thd	Flanged
1/2	2-9/16	3-7/16	5-3/16	2-13/32	2-23/32	3-1/2	3-15/32	1.05	1.23	.95	1.14	20	25	18
3/4	3-1/32	4-1/16	6-3/16	2-5/8	3-3/16	3-7/8	4	1.44	1.64	1.50	1.73	30	51	36
1	3-13/32	4-5/16	6-9/16	2-13/16	3-23/32	4-1/4	4-5/16	1.91	2.22	2.08	2.43	40	97	67
1-1/4	3-11/16	4-1/2	7-1/16	2-31/32	4-1/8	4-5/8	4-19/32	2.38	2.78	2.52	2.91	60	204	142
1-1/2	4-3/8	5-5/16	8-1/32	3-9/32	4-15/32	5	5-9/32	3.63	4.00	3.82	4.26	80	285	201
2	5-3/16	5-13/16	8-13/16	4-13/32	5-1/4	6	5-23/32	5.40	6.14	5.70	6.54	90	540	381
2-1/2	7-7/16	8-3/8	11-7/8	4-29/32	9-7/8	7	7-3/16	12.87	14.26	13.44	15.85	300	712	512
3	7-7/16	8-3/16	11-15/16	4-29/32	9-7/8	7-1/2	7-11/32	13.24	15.67	13.85	16.96	300	1294	925
4	8-15/16	8-11/16	13-3/16	5-19/32	10-13/16	9-1/16	8-5/32	19.58	24.32	20.49	25.83	400	2629	1868
6 Socket[3]	8-15/16	19-5/8	26-1/16	6-3/4	10-13/16	11-1/4	14-11/16	22.66	30.98	26.11	34.78	400	N/A	N/A
6 Flanged[3]	11-3/16	29-3/8	N/A	6-3/4	10-13/16	11-1/4	14-11/16	N/A	N/A	N/A	N/A	400	N/A	N/A

1: Valve Lay Lengths.
2: Torque required at valve maximum internal pressure rating, 5 ft./sec. flow velocity.
3: Consists of 4" True Union Ball Valve with two 4" x 6" Adapters.
4: Gallons per minute at 1 psi pressure drop. Values calculated from valve laying length, based on derivative of Hazen-Williams equation with surface roughness factor of C=150.
C_V Valves for 6" venturied flange and socket valves are not available.

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	2-1/2" - 6"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

NOTE: Flanged Valves have a base pressure rating of 150 psi.

NOT FOR USE WITH COMPRESSED AIR OR GASES

TRUE UNION BALL CHECK VALVES
(REGULAR STYLE)

Sample Engineering Specification

All thermoplastic check valves shall be True Union Ball type constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be EPDM or Viton®. All valve union nuts shall have Buttress threads. All valve components shall be replaceable. All valves shall be certified by NSF International for use in potable water service. All 1/2" - 2" valves shall be pressure rated at 235 psi and all 2-1/2" - 6" and all flanged valves shall be pressure rated at 150 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.

Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Part Number[1]			Pressure Rating
		Threaded	Socket	Flanged	
1/2	EPDM	2229-005	included	2223-005	235 psi Non-Shock Water @ 73°F (Flanged 150 psi Non-Shock) Water @ 73°F
	Viton®	2239-005	included	2233-005	
3/4	EPDM	2229-007	included	2223-007	
	Viton®	2239-007	included	2233-007	
1	EPDM	2229-010	included	2223-010	
	Viton®	2239-010	included	2233-010	
1-1/4	EPDM	2229-012	included	2223-012	
	Viton®	2239-012	included	2233-012	
1-1/2	EPDM	2229-015	included	2223-015	
	Viton®	2239-015	included	2233-015	
2	EPDM	2229-020	included	2223-020	
	Viton®	2239-020	included	2233-020	
2-1/2	EPDM	2221-025	2222-025	2223-025	150 psi Non-Shock Water @ 73°F
	Viton®	2231-025	2232-025	2233-025	
3	EPDM	2221-030	2222-030	2223-030	
	Viton®	2231-030	2232-030	2233-030	
4	EPDM	2221-040	2222-040	2223-040	
	Viton®	2231-040	2232-040	2233-040	
6[2] venturied	EPDM	---	2222-060	2223-060	
	Viton®	---	2232-060	2333-060	

1: For CPVC valves, add the letter "CŽ to part numbers listed (e.g., 2239-006).
2: Consists of 4" True Union Ball Valve with two 4" x 6" Adapters.

Features … PVC, CPVC

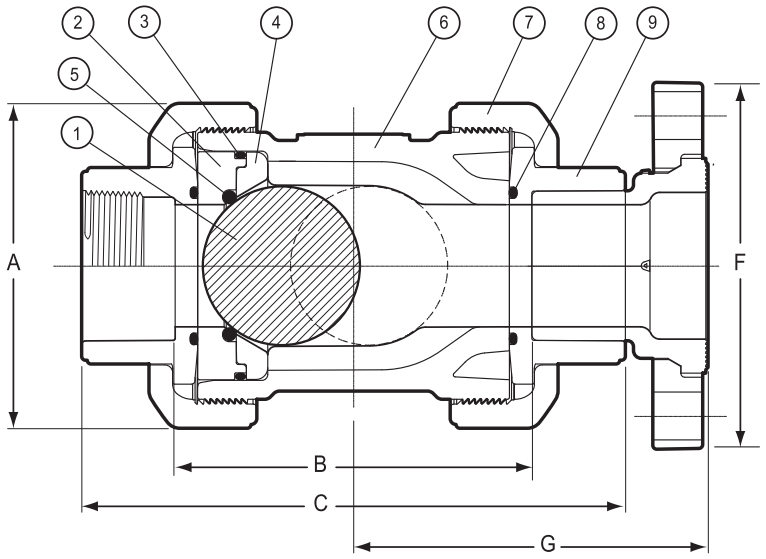
Flow tested design provides quick response with positive seal for prevention of system back flow in industrial and chemical processing applications. Available in IPS Sizes 1/2"- 4" with socket, threaded or flanged end connectors. 6" Venturied valve (4" valve with 4 x 6 reducer) available with either socket or flanged end connection. Also available with metric 20mm - 110mm or 1/2" - 4" BSP thread end connectors. **Note:** Seal carrier is NOT blocked (for Safe-T-Blocked® seal carrier design, see True Union 2000 Industrial Ball Check Valve).

- € Chemical & Corrosion Resistant PVC or CPVC Construction
- € Strong, Buttress Thread Union Nuts
- € Fully Serviceable, Replaceable Components
- € Uses Standard O-ring Seat
- € EPDM or Viton® O-rings
- € Sizes 1/2" - 2" Pressure Rated to 235 psi @ 73°F, Sizes 2-1/2" - 6" and all Flanged Pressure Rated to 150 psi @ 73°F
- € Suitable for Either Horizontal or Vertical Installations
- € NSF Certified for Potable Water use
- € Suitable for Vacuum Service
- € Assembled with Silicone-Free, Water Soluble Lubricants
- € Manufactured to ASTM F 1970

Ball Check Foot Valves

Spears® Ball Check Valves easily convert to foot valves utilizing optional Foot Valve Screen adapters found in Ball Valve Accessories section.

TRUE UNION BALL CHECK VALVES
(REGULAR STYLE)



Replacement Parts

No.	Component	Qty.	Material
1	Ball	1	PVC/CPVC
2	Seal Carrier	1	PVC/CPVC
3	Carrier O-ring	1	EPDM/Viton®
4	Seat Plate	1	PVC/CPVC
5	Seat O-ring	1	EPDM/Viton®
6	Body	1	PVC/CPVC
7	Union Nut	2	PVC/CPVC
8	End Connector O-ring	2	EPDM/Viton®
9	End Connector	2	PVC/CPVC

Dimensions, Weights, C_V Values & Horizontal Closing Requirements

Nominal Size	Dimension Reference (inches, ± 1/16)					Approx. Wt. (Lbs.)		Cv[3] Values		Horizontal Closing	
	A	B[1]	C	F	G	PVC	CPVC	Threaded/ Socket	Flanged	Feet of Head (water)	GPM (minimum)
1/2	2-9/16	3-5/16	5-1/8	3-1/2	3-7/16	.56	.61	11	10	1.6	.10
3/4	3	4	6-1/8	3-7/8	3-15/16	.91	.99	18	17	1.6	.10
1	3-7/16	4-1/4	6-1/2	4-1/4	4-3/8	1.20	1.30	32	30	1.6	.25
1-1/4	3-11/16	4-1/2	7	4-5/8	4-9/16	1.50	1.60	58	55	1.6	.40
1-1/2	4-3/8	5-5/16	8-1/16	5	5-1/4	2.50	2.70	94	89	1.6	.75
2	5-1/8	5-3/4	8-3/4	6	5-5/8	3.70	4.00	153	146	1.6	.75
2-1/2	7-3/8	8-5/16	11-7/8	7	7-1/4	11.10	12.21	159	155	1.0	1.50
3	7-3/8	8-1/8	11-7/8	7-1/2	7-1/2	10.84	11.91	378	361	1.0	4.00
4	8-15/16	8-1/4	12-15/16	9-1/16	8-1/8	17.60	19.36	551	537	1.0	5.50
6 Socket[2]	8-15/16	19-5/8	26-1/16	N/A	N/A	22.45	27.61	N/A	N/A	N/A	N/A
6 Flanged[2]	11-3/16	29-3/8	N/A	11-1/4	14-3/4	31.21	37.07	N/A	N/A	N/A	N/A

1: Valve Lay Length
2: Consists of 4" True Union Ball Check Valve with two 4" x 6" Adapters.
3: Gallons per minute at 1 psi pressure drop.
C_V Values for 6" venturied flange and socket valves are not available.

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	2-1/2" - 6"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

NOTE: Flanged Valves have a base pressure rating of 150 psi.

General Installation Information: Ball check valves may be installed in either horizontal or vertical position. A minimum of ten (10) pipe diameters distance maintained from any pump or other source of turbulence. Ball Check valves **MUST** be installed with the valves **FLOW** arrow pointing in the direction of flow.

NOT FOR USE WITH COMPRESSED AIR OR GASES

COMPACT BALL VALVES

Features … PVC, CPVC

This industrial grade, quarter turn shutoff valve is popular where maintenance-free installations are desired for a variety of chemical processing, industrial and OEM applications. IPS Sizes 1/2" - 4" available with socket, threaded or flanged end connectors, 6" size available with socket or flanged end connectors. 6" valve uses high-efficiency lever style handle for easier operation.

- € Chemical & Corrosion Resistant PVC or CPVC Construction
- € Maintenance-Free Sealed Unit
- € Schedule 80 Full-Bore Design
- € High Impact Polypropylene Handle
- € Spears® Single O-ring Safe-T-Shear® Stem Design
- € EPDM or Viton® O-rings
- € Self Adjusting PTFE Floating Seat Design
- € Sizes 1/2" - 2" Pressure Rated to 235 psi @ 73°F, Sizes 3" - 6" and all Flanged Pressure Rated to 150 psi @ 73°F
- € NSF Certified for Potable Water use
- € Suitable for Vacuum Service
- € Assembled with Silicone-Free, Water Soluble Lubricant
- € Manufactured to ASTM F 1970

Note: Valve size 6" uses Lever Handle (not shown)

Sample Engineering Specification

All thermoplastic ball valves shall be Compact sealed unit type constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, Cell Classification 23447. All O-rings shall be EPDM or Viton®. All valves shall have Safe-T-Shear® stem and Polypropylene handle. All valves shall be certified by NSF International for use in potable water service. All 1/2" - 2" valves shall be pressure rated at 235 psi, all 3" - 6" and all flanged valves shall be pressure rated at 150 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.

Quick-View Valve Selection Chart

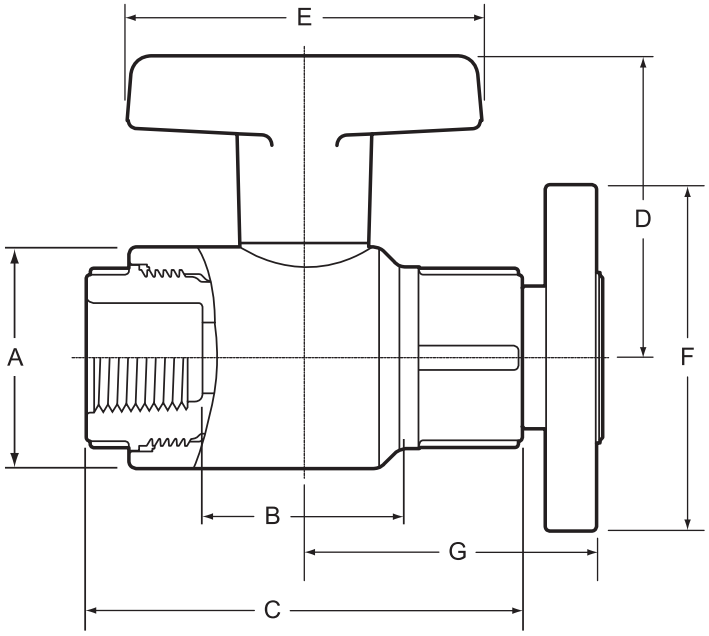
Valve Size	O-ring Material	PVC Part Numbers[1]			Pressure Rating
		Socket	Threaded	Flanged	
1/2	EPDM	2122-005	2121-005	2123-005	235 psi Non-Shock Water @ 73°F (Flanged 150 psi Non-Shock) Water @ 73°F
	Viton®	2132-005	2131-005	2133-005	
3/4	EPDM	2122-007	2121-007	2123-007	
	Viton®	2132-007	2131-007	2133-007	
1	EPDM	2122-010	2121-010	2123-010	
	Viton®	2132-010	2131-010	2133-010	
1-1/4	EPDM	2122-012	2121-012	2123-012	
	Viton®	2132-012	2131-012	2133-012	
1-1/2	EPDM	2122-015	2121-015	2123-015	
	Viton®	2132-015	2131-015	2133-015	
2	EPDM	2122-020	2121-020	2123-020	
	Viton®	2132-020	2131-020	2133-020	
3	EPDM	2122-030	2121-030	2123-030	150 psi Non-Shock Water @ 73°F
	Viton®	2132-030	2131-030	2133-030	
4	EPDM	2122-040	2121-040	2123-040	
	Viton®	2132-040	2131-040	2133-040	
6	EPDM	2122-060	––	2123-060	
	Viton®	2132-060	––	2133-060	

1: For CPVC valves, add the letter "C" to the part numbers listed (e.g., 2131-005**C**).

Optional Accessories*

- € Round Safety Handle
- € Stem Extension Kit
- € Mini-Mount Actuation Mounting Kit
- € 2" Square/T-Style Operator Nut

*See □***BALL VALVE ACCESSORIESŽ** section for details of individual products.



Dimensions, Weights, Operating Torque & C_V Values

Nominal Size	Dimension Reference (inches, ± 1/16)								Approx. Wt. (Lbs.)		Oper.[2] Torque (in.-lb.)	Cv^3 Values	
	A	B[1]		C	D	E[4]	F	G	PVC	CPVC		Soc/Thd	Flanged
		Socket	Threaded										
1/2	1-11/16	1-5/8	1-7/8	3-3/8	2-5/16	2-3/4	3-1/2	2-17/32	.31	.32	20	36	20
3/4	2-1/8	1-15/16	2-7/16	4-1/16	2-11/16	3-1/4	3-7/8	2-27/32	.49	.52	30	74	42
1	2-7/16	2-1/16	2-3/8	4-7/16	2-7/8	3-3/4	4-1/4	3-1/16	.64	.69	40	141	80
1-1/4	2-13/16	2-3/8	3	4-15/16	3-5/16	4-1/8	4-5/8	3-13/32	.93	.98	60	284	163
1-1/2	3-1/4	2-13/16	3-1/2	5-5/8	3-11/16	4-1/2	5	4	1.39	1.45	80	402	229
2	4-1/16	3-3/8	4-7/16	6-1/2	4-3/8	5-1/4	5-7/8	4-13/32	2.33	2.45	90	706	429
3	5-5/16	4-9/16	5-1/2	8-5/16	5-1/2	7-21/32	7-1/2	5-7/16	4.49	5.02	300	1660	1079
4	7-3/8	6-3/16	7-3/16	10-5/32	6-5/8	10-27/32	9-1/16	6-7/8	9.50	10.24	400	3104	2028
6[4]	10-3/16	8	10-3/4	14-1/8	8-1/16	14-5/16	11-1/4	8-21/32	21.48	23.41	900	7942	5268

1: Valve Lay Length
2: Torque required at valve maximum internal pressure rating, 5 ft./sec. flow velocity.
3: Gallons per minutes at 1 psi pressure loss. Values calculated from valve laying length, based on derivative of Hazen-Williams equation with surface roughness factor of C =150.
4: 6" valve has lever handle, dimension is from valve centerline (not illustrated)

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	3" - 6"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

NOT FOR USE WITH COMPRESSED AIR OR GASES

SINGLE ENTRY BALL VALVES

Sample Engineering Specification

All thermoplastic ball valves shall be Single Entry type constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be Buna-N, EPDM or Viton®. All valves shall have Safe-T-Shear® stem and double stop Polypropylene handle. All valve union nuts shall have Buttress threads. All valve components shall be replaceable. All valves shall be certified by NSF International for use in potable water service. All 1/2" - 2" valves shall be pressure rated at 235 psi and all 3" - 4" valves shall be pressure rated at 150 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.

Features … PVC GrayPVC White

This quarter-turn shutoff valve is widely chosen for industrial and chemical processing, turf and irrigation, plus pool and spa applications. Available in PVC Gray or PVC White, IPS Sizes 1/2"- 4" with socket or threaded end connectors. **Note:** Seal carrier is NOT blocked (see True Union 2000 Valves).

- € Chemical & Corrosion Resistant PVC Gray or PVC White Construction
- € Schedule 80 Full-Bore Design
- € Strong, Buttress Thread Union Nut
- € High Impact Polypropylene Handle
- € Spears® Single O-ring Safe-T-Shear® Stem Design
- € Buna-N, EPDM or Viton® O-rings
- € Self Adjusting PTFE Floating Seat Design
- € Fully Serviceable, Replaceable Components
- € Sizes 1/2" - 2" Pressure Rated to 235 psi @ 73°F, Sizes 3" - 4" Pressure Rated to 150 psi @ 73°F
- € NSF Certified for Potable Water use
- € Suitable for Vacuum Service
- € Assembled with Silicone-Free, Water Soluble Lubricant
- € Manufactured to ASTM F 1970

Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Gray Part Numbers[1]		Pressure Rating
		Socket	Threaded	
1/2	Buna-N	2412-005G	2411-005G	235 psi Non-Shock Water @ 73°F
	EPDM	2422-005G	2421-005G	
	Viton®	2432-005G	2431-005G	
3/4	Buna-N	2412-007G	2411-007G	
	EPDM	2422-007G	2421-007G	
	Viton®	2432-007G	2431-007G	
1	Buna-N	2412-010G	2411-010G	
	EPDM	2422-010G	2421-010G	
	Viton®	2432-010G	2431-010G	
1-1/4	Buna-N	2412-012G	2411-012G	
	EPDM	2422-012G	2421-012G	
	Viton®	2432-012G	2431-012G	
1-1/2	Buna-N	2412-015G	2411-015G	
	EPDM	2422-015G	2421-015G	
	Viton®	2432-015G	2431-015G	
2	Buna-N	2412-020G	2411-020G	
	EPDM	2422-020G	2421-020G	
	Viton®	2432-020G	2431-020G	
3	Buna-N	2412-030G	2411-030G	150 psi Non-Shock Water @ 73°F
	EPDM	2422-030G	2421-030G	
	Viton®	2432-030G	2431-030G	
4	Buna-N	2412-040G	2411-040G	
	EPDM	2422-040G	2421-040G	
	Viton®	2432-040G	2431-040G	

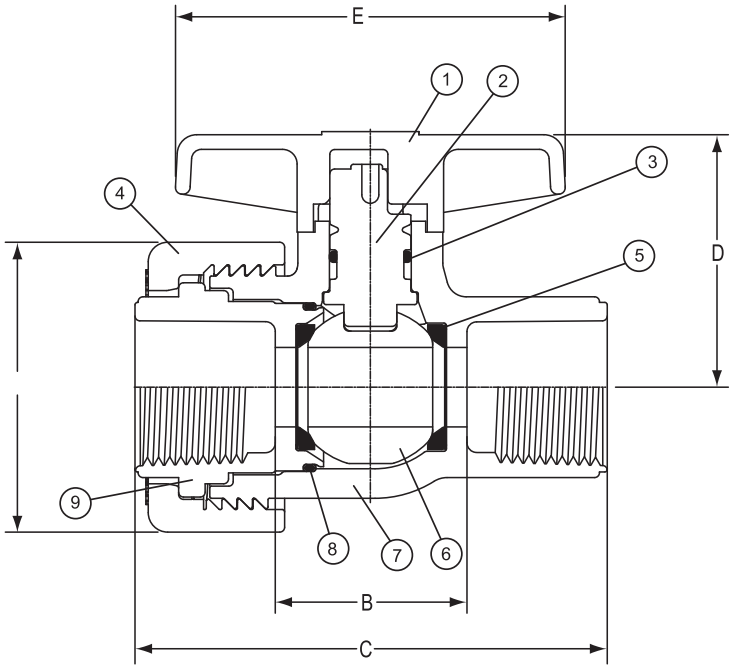
1: For PVC White valves, replace the letter □GŽ with the letter □WŽ at the end of the part number listed (e.g., 2421-005**W**).

Optional Accessories*

- € Round Safety Handle
- € Stem Extension Kit
- € Mini-Mount Actuation Mounting Kit
- € 2" Square / T-Style Operator Nut

*See □***BALL VALVE ACCESSORIESŽ** section for details of individual products.

SINGLE ENTRY BALL VALVES



Replacement Parts

No.	Component	Qty.	Material
1	Handle	1	PP
2	Stem	1	PVC
3	Stem O-ring	1	Buna-N/EPDM/Viton®
4	Union Nut	1	PVC
5	Seat	2	PTFE
6	Ball	1	PVC
7	Body	1	PVC
8	Carrier O-ring	1	Buna-N/EPDM/Viton®
9	Seal Carrier	1	PVC

Seat O-rings (not shown) on sizes 3" and larger.

Dimensions, Weights, Operating Torque & C_V Values

Nominal Size	Dimension Reference (inches, ± 1/16)						Approx. Wt. (Lbs.)	Oper.[2] Torque (in.-lb.)	C_V[3] Values
	A	B[1]		C	D	E			
		Socket	Threaded						
1/2	1-15/16	1-1/4	1-5/8	3-1/16	1-5/8	2-1/2	.22	20	38
3/4	2-3/8	1-7/16	2-1/8	3-9/16	2	3	.36	30	76
1	2-5/8	1-5/8	2-1/8	3-7/8	2-5/16	3-15/16	.50	40	146
1-1/4	3-1/8	1-15/16	2-1/4	4-1/8	2-13/16	3-1/2	.75	60	292
1-1/2	3-9/16	2-3/8	2-3/4	4-5/8	3-1/16	3-7/8	1.00	80	412
2	4-5/16	3-1/16	3-5/8	5-1/2	3-3/4	5	2.00	90	720
3	6-3/16	4-3/8	5-3/8	8-1/8	5-1/2	7-5/8	7.00	300	1660
4	7-3/4	5-11/16	6-7/8	9-3/4	6-1/8	9-1/16	12.00	400	3104

1: Valve Lay Length
2: Torque required at valve maximum internal pressure rating, 5 ft./sec. flow velocity; due to adjustment differences during installation, actual values may vary.
3: Gallons per minute at 1 psi pressure drop. Values calculated from valve laying length, based on derivative of Hazen-Williams equation with surface roughness factor of C=150.

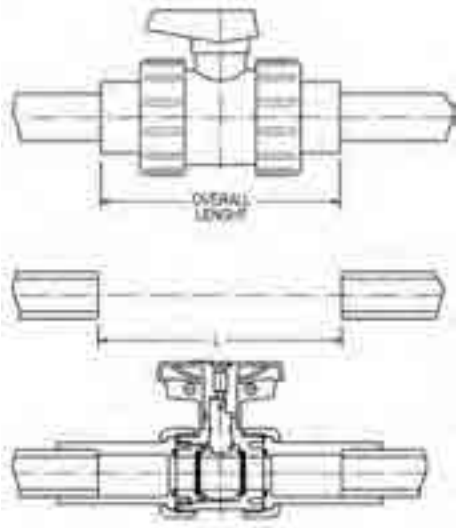
Temperature Pressure Rating

System Operating Temperature °F (°C)			73 (23)	100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	146 (1.01)	118 (.81)	94 (.65)	71 (.49)	52 (.36)	-0- (-0-)
	3" - 4"	PVC	150 (1.03)	93 (.64)	75 (.52)	60 (.41)	45 (.31)	33 (.23)	-0- (-0-)

NOT FOR USE WITH COMPRESSED AIR OR GASES

True Union 2000 Retrofit Kits

Easily converts any system over to all True Union 2000 style valves for consistent valve type and uniform maintenance. Special extended socket style End Connectors (2) allow retrofit replacement of older Spears® and other brand valves in existing piping systems with a new True Union 2000 valve. Simply cut out old valve according to specified dimension and install retrofit end connectors. End connectors are provided with either EPDM or Viton® O-rings.



Ball Valve for Replacement

Pipe Laying Length After Cutting

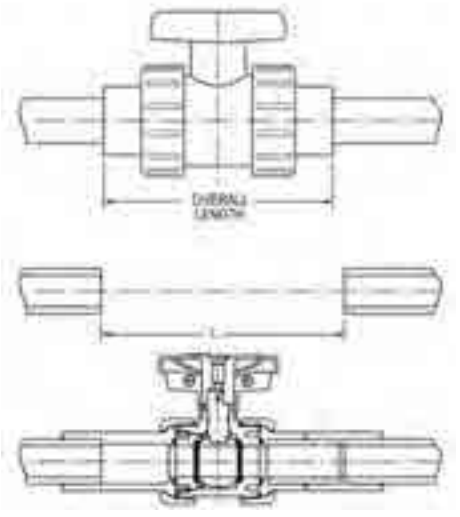
True Union 2000 Ball Valve Installed with Retrofit Kit

True Union Retrofit Kits - Other Brand Valves (Socket Style Only)

Kit Size	EPDM		Viton®	
	PVC	CPVC	PVC	CPVC
1/2	RFK2-005	RFK2-005C	RFK3-005	RFK3-005C
3/4	RFK2-007	RFK2-007C	RFK3-007	RFK3-007C
1	RFK2-010	RFK2-010C	RFK3-010	RFK3-010C
1-1/4	RFK2-012	RFK2-012C	RFK3-012	RFK3-012C
1-1/2	RFK2-015	RFK2-015C	RFK3-015	RFK3-015C
2	RFK2-020	RFK2-020C	RFK3-020	RFK3-020C
2-1/2	RFK2-025	RFK2-025C	RFK3-025	RFK3-025C
3	RFK2-030	RFK2-030C	RFK3-030	RFK3-030C
4	RFK2-040	RFK2-040C	RFK3-040	RFK3-040C

Cut-Out Dimensions

Size	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
L	4-29/32	5-7/16	6-3/32	7-1/4	7-1/2	8-17/32	10-3/4	11-7/16	14-15/16



Ball Valve for Replacement

Pipe Laying Length After Cutting

True Union Ball Valve Installed with Retrofit Kit

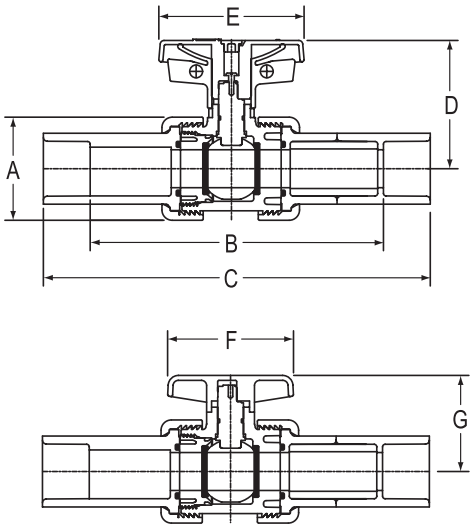
True Union Retrofit Kits - Older (Regular Style) Spears® Valves

(Socket Style Only)

Kit Size	EPDM		Viton®	
	PVC	CPVC	PVC	CPVC
1/2	RFKS2-005	RFKS2-005C	RFKS3-005	RFKS3-005C
3/4	RFKS2-007	RFKS2-007C	RFKS3-007	RFKS3-007C
1	RFKS2-010	RFKS2-010C	RFKS3-010	RFKS3-010C
1-1/4	RFKS2-012	RFKS2-012C	RFKS3-012	RFKS3-012C
1-1/2	RFKS2-015	RFKS2-015C	RFKS3-015	RFKS3-015C
2	RFKS2-020	RFKS2-020C	RFKS3-020	RFKS3-020C
2-1/2	RFKS2-025	RFKS2-025C	RFKS3-025	RFKS3-025C
3	RFKS2-030	RFKS2-030C	RFKS3-030	RFKS3-030C
4	RFKS2-040	RFKS2-040C	RFKS3-040	RFKS3-040C

Cut-Out Dimensions

Size	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
L	5-5/16	6-1/4	6-11/16	7-1/8	8-3/16	5-15/16	12	12-1/16	13-3/16



True Union 2000 Retrofit Ball Valve Complete replacement valve for older Spears® 2300 series Regular True Union Ball Valves.

Retrofit valve consists of either Spears® Standard or Industrial True Union 2000 Ball Valve supplied with factory installed extended socket end connectors. Simply cut out old valve to specified dimensions (see cut-out dimensions, page 37) and install Retrofit Valve end connectors.

Dimensions

Size	A ± 1/16	B ± 1/16	C ± 1/16	D ± 1/16	E ± 1/16	F ± 1/16	G ± 1/16
1/2	1-7/8	5-5/16	7-1/16	2-9/16	2-13/16	2-1/2	1-5/8
3/4	2-1/4	6-1/4	8-1/4	2-7/8	3-5/16	3	2
1	2-1/2	6-11/16	8-15/16	3-1/8	3-7/16	3-7/16	2-5/16
1-1/4	3-1/16	7-1/8	9-3/4	3-5/8	3-13/16	3-9/16	2-13/16
1-1/2	3-1/2	8-3/16	10-15/16	4	4-3/16	3-7/8	3-1/16
2	4-1/4	8-15/16	11-15/16	4-1/2	5-1/8	5	3-3/4
2-1/2	6-3/16	12	15-1/2	5-1/8	6-1/4	7-5/16	5-7/8
3	6-3/16	12-1/16	15-7/8	5-7/8	7-5/8	7-5/16	5-7/8
4	7-5/8	13-3/16	19	6-3/4	9-3/16	8-3/8	6-3/4

True Union 2000 Retrofit Ball Valve - Replaces Older (Regular Style) Spears® Valves

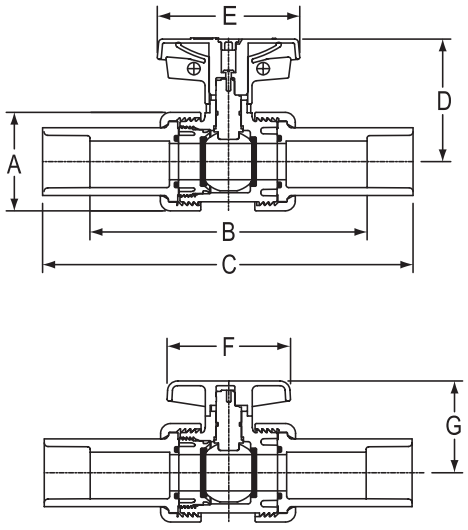
Size	TU 2000 Industrial Retrofit Ball Valves				TU 2000 Standard Retrofit Ball Valves			
	EPDM		VITON®		EPDM		VITON®	
	PVC	CPVC	PVC	CPVC	PVC	CPVC	PVC	CPVC
1/2	1822RS-005	1822RS-005C	1832RS-005	1832RS-005C	3622RS-005	3622RS-005C	3632RS-005	3632RS-005C
3/4	1822RS-007	1822RS-007C	1832RS-007	1832RS-007C	3622RS-007	3622RS-007C	3632RS-007	3632RS-007C
1	1822RS-010	1822RS-010C	1832RS-010	1832RS-010C	3622RS-010	3622RS-010C	3632RS-010	3632RS-010C
1-1/4	1822RS-012	1822RS-012C	1832RS-012	1832RS-012C	3622RS-012	3622RS-012C	3632RS-012	3632RS-012C
1-1/2	1822RS-015	1822RS-015C	1832RS-015	1832RS-015C	3622RS-015	3622RS-015C	3632RS-015	3632RS-015C
2	1822RS-020	1822RS-020C	1832RS-020	1832RS-020C	3622RS-020	3622RS-020C	3632RS-020	3632RS-020C
2-1/2	1822RS-025	1822RS-025C	1832RS-025	1832RS-025C	3622RS-025	3622RS-025C	3632RS-025	3632RS-025C
3	1822RS-030	1822RS-030C	1832RS-030	1832RS-030C	3622RS-030	3622RS-030C	3632RS-030	3632RS-030C
4	1822RS-040	1822RS-040C	1832RS-040	1832RS-040C	3622RS-040	3622RS-040C	3632RS-040	3632RS-040C

True Union 2000 Check Valve Seal Carrier Tool

Size	Part Number
1/2	TSK-00503
3/4	TSK-00703
1	TSK-01003
1-1/4	TSK-01203
1-1/2	TSK-01503
2	TSK-02003
3	TSK-03003
4	TSK-04003
6	TSK-06003

True Union 2000 Ball Valve Seal Carrier Tool

Size	Part Number
1/2	TSK1-00503
3/4	TSK1-00703
1	TSK1-01003
1-1/4	TSK1-01203
1-1/2	TSK1-01503
2	TSK1-02003
3	TSK-03003
4	TSK-04003
6	TSK-06003



True Union 2000 Retrofit Ball Valve Complete universal replacement valve for domestic and import PVC or CPVC valve.

Retrofit consists of either Spears® Standard or Industrial True Union 2000 Ball Valve supplied with factory installed extended socket end connectors. Simply cut out old valve to specified dimensions (see cut-out dimensions, page 37) and install Retrofit Valve end connectors.

Dimensions

Size	A ± 1/16	B ± 1/16	C ± 1/16	D ± 1/16	E ± 1/16	F ± 1/16	G ± 1/16
1/2	1-7/8	4-15/16	6-11/16	2-9/16	2-13/16	2-1/2	1-5/8
3/4	2-1/4	5-7/16	7-1/2	2-7/8	3-3/8	3	2
1	2-1/2	6-1/16	8-5/16	3-1/8	3-7/16	3-7/16	2-5/16
1-1/4	3-1/16	7-5/16	9-7/8	3-5/8	3-7/8	3-9/16	2-13/16
1-1/2	3-1/2	7-1/2	10-5/16	4	4-3/16	3-7/8	3-1/16
2	4-1/4	8-1/2	11-1/2	4-1/2	5-1/8	5	3-3/4
2-1/2	6-3/16	10-7/8	14-3/8	5-7/8	7-5/8	7-5/16	5-7/8
3	6-3/16	11-1/2	15-3/16	5-7/8	7-5/8	7-5/16	5-7/8
4	7-5/8	14-3/8	18-15/16	6-3/4	9	8-3/8	6-3/4

True Union 2000 Retrofit Ball Valve - Replaces Other Brand Valves

Size	TU 2000 Industrial Retrofit Ball Valves				TU 2000 Standard Retrofit Ball Valves			
	EPDM		VITON®		EPDM		VITON®	
	PVC	CPVC	PVC	CPVC	PVC	CPVC	PVC	CPVC
1/2	1822R-005	1822R-005C	1832R-005	1832R-005C	3622R-005	3622R-005C	3632R-005	3632R-005C
3/4	1822R-007	1822R-007C	1832R-007	1832R-007C	3622R-007	3622R-007C	3632R-007	3632R-007C
1	1822R-010	1822R-010C	1832R-010	1832R-010C	3622R-010	3622R-010C	3632R-010	3632R-010C
1-1/4	1822R-012	1822R-012C	1832R-012	1832R-012C	3622R-012	3622R-012C	3632R-012	3632R-012C
1-1/2	1822R-015	1822R-015C	1832R-015	1832R-015C	3622R-015	3622R-015C	3632R-015	3632R-015C
2	1822R-020	1822R-020C	1832R-020	1832R-020C	3622R-020	3622R-020C	3632R-020	3632R-020C
2-1/2	1822R-025	1822R-025C	1832R-025	1832R-025C	3622R-025	3622R-025C	3632R-025	3632R-025C
3	1822R-030	1822R-030C	1832R-030	1832R-030C	3622R-030	3622R-030C	3632R-030	3632R-030C
4	1822R-040	1822R-040C	1832R-040	1832R-040C	3622R-040	3622R-040C	3632R-040	3632R-040C

Split-Nut Repair Kits for All True Union 2000 Valves, Union 2000 Pipe Unions and True Union Diaphragm Valves

- Allows replacement of broken Union Nuts
- No Reduction in Valve Operating Pressure
- Kit includes 2-piece Split Nut and SS 316 Gear Clamp
- Simply cut or remove broken nut, align Split-Nut halves around end connector and secure with Gear Clamp. Thread nut onto valve to complete repair.

Note: Split-Nut Repair Kit does **NOT** fit Regular Style True Union Valves

Valve Size	PVC Kit	CPVC Kit
1/2	SNK-005	SNK-005C
3/4	SNK-007	SNK-007C
1	SNK-010	SNK-010C
1-1/4	SNK-012	SNK-012C
1-1/2	SNK-015	SNK-015C
2	SNK-020	SNK-020C
2-1/2	SNK-025	SNK-025C
3	SNK-030	SNK-030C
4	SNK-040	SNK-040C

BALL VALVE ACCESSORIES

Supplemental End Connector Sets for All True Union 2000 Valves, Union 2000 Pipe Unions and True Union Diaphragm Valves

- Allows easy conversion of valve end connections due to system change, modification, or inadvertent misorder of product.
- Each set includes 2 each of either Socket, SR Threaded or Spigot End connectors with either EPDM or Viton® O-rings installed.

Socket End Connector Set (2)

Valve Size	PVC Part Number		CPVC Part Number	
	EPDM O-ring	Viton® O-ring	EPDM O-ring	Viton® O-ring
1/2	ECS2-005	ECS3-005	ECS2-005C	ECS3-005C
3/4	ECS2-007	ECS3-007	ECS2-007C	ECS3-007C
1	ECS2-010	ECS3-010	ECS2-010C	ECS3-010C
1-1/4	ECS2-012	ECS3-012	ECS2-012C	ECS3-012C
1-1/2	ECS2-015	ECS3-015	ECS2-015C	ECS3-015C
2	ECS2-020	ECS3-020	ECS2-020C	ECS3-020C
2-1/2	ECS2-025	ECS3-025	ECS2-025C	ECS3-025C
3	ECS2-030	ECS3-030	ECS2-030C	ECS3-030C
4	ECS2-040	ECS3-040	ECS2-040C	ECS3-040C
6	ECS2-060	ECS3-060	ECS2-060C	ECS3-060C

SR Threaded End Connector Set (2)

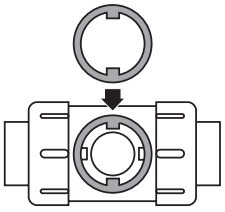
Valve Size	PVC Part Number		CPVC Part Number	
	EPDM O-ring	Viton® O-ring	EPDM O-ring	Viton® O-ring
1/2	ECSRT2-005	ECSRT3-005	ECSRT2-005C	ECSRT3-005C
3/4	ECSRT2-007	ECSRT3-007	ECSRT2-007C	ECSRT3-007C
1	ECSRT2-010	ECSRT3-010	ECSRT2-010C	ECSRT3-010C
1-1/4	ECSRT2-012	ECSRT3-012	ECSRT2-012C	ECSRT3-012C
1-1/2	ECSRT2-015	ECSRT3-015	ECSRT2-015C	ECSRT3-015C
2	ECSRT2-020	ECSRT3-020	ECSRT2-020C	ECSRT3-020C
2-1/2	ECSRT2-025	ECSRT3-025	ECSRT2-025C	ECSRT3-025C
3	ECSRT2-030	ECSRT3-030	ECSRT2-030C	ECSRT3-030C
4	ECSRT2-040	ECSRT3-040	ECSRT2-040C	ECSRT3-040C
6	ECSRT2-060	ECSRT3-060	ECSRT2-060C	ECSRT3-060C

Spigot End Connector Set (2)

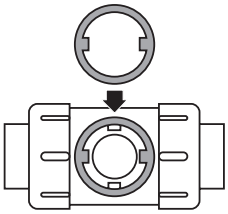
Valve Size	PVC Part Number		CPVC Part Number	
	EPDM O-ring	Viton® O-ring	EPDM O-ring	Viton® O-ring
1/2	ECSP2-005	ECSP3-005	ECSP2-005C	ECSP3-005C
3/4	ECSP2-007	ECSP3-007	ECSP2-007C	ECSP3-007C
1	ECSP2-010	ECSP3-010	ECSP2-010C	ECSP3-010C
1-1/4	ECSP2-012	ECSP3-012	ECSP2-012C	ECSP3-012C
1-1/2	ECSP2-015	ECSP3-015	ECSP2-015C	ECSP3-015C
2	ECSP2-020	ECSP3-020	ECSP2-020C	ECSP3-020C
2-1/2	ECSP2-025	ECSP3-025	ECSP2-025C	ECSP3-025C
3	ECSP2-030	ECSP3-030	ECSP2-030C	ECSP3-030C
4	ECSP2-040	ECSP3-040	ECSP2-040C	ECSP3-040C
6	ECSP2-060	ECSP3-060	ECSP2-060C	ECSP3-060C

Handle Lockout Ring for True Union 2000 Industrial Ball Valves

- Use with Built-in Handle Lockout Device
- Allows selective lockout position of Lock-Open Only or Lock-Closed Only
- Simply remove valve handle and install ring below handle lockout mechanism



Lock-Closed Only Position



Lock-Open Only Position

Valve Size	Part Number
1/2	TU2LR-005
3/4	TU2LR-007
1	TU2LR-010
1-1/4	TU2LR-012
1-1/2	TU2LR-015
2	TU2LR-020
2-1/2 & 3	TU2LR-030
4	TU2LR-040

BALL VALVE ACCESSORIES

Typical Application (VALVE AND RISER NOT INCLUDED)

Stem Extension Kits

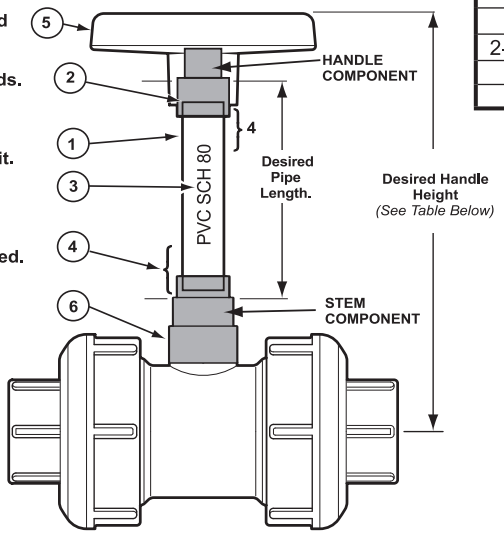
- Kits for True Union 2000 Valves and for Regular True Union, Single Entry or Compact Ball Valves
- Simple 2-Piece Kit for use with existing Valve Handle and Schedule 80 pipe, or can be ordered factory assembled to desired length as 1-piece unit.
- Kit includes 1 - Stem Adapter and 1 - Handle Adapter
- Corrosion resistant PVC construction

2-Piece Stem Extension Kit

Valve Size	Part Numbers[1]	
	For True Union 2000, Compact 2000 & Single Entry Ball Valves[2]	For Regular True Union & Compact Ball Valves
1/2	BVSE2-005-000	BVSE-005-000
3/4	BVSE2-007-000	BVSE-007-000
1	BVSE2-010-000	BVSE-010-000
1-1/4	BVSE2-012-000	BVSE-012-000
1-1/2	BVSE2-015-000	BVSE-015-000
2	BVSE2-020-000	BVSE-020-000
2-1/2 & 3	BVSE2-030-000	BVSE-030-000
4	BVSE2-040-000	BVSE-040-000
6	BVSE2-060-000	N/A

1: For factory assembled units replace last 3 zeros with length code. See ***Thermoplastic Valves, Strainers & Accessories***, Price Schedule V-1 for length codes.
2: Not for use on True Union 2000 Industrial 3-Way Ball Valves

1. **Cut pipe square to desired length** *(See Table Below)*.
2. **Bevel and deburr pipe ends.**
3. **Align edge of print string or mark each end of pipe for alignment; check dry fit.**
4. **Solvent cement components to pipe making sure alignment marks are properly matched.**
5. **Push valve handle onto extension assembly.**
6. **Position assembly over valve stem and rotate into place.**



Required for Assembly:

- Two-Piece Stem Extension Kit
- Desired Length of PVC Schedule 80 Pipe*
- Saw & Miter Box or Wheel-Type Cutter
- PVC Solvent Cement & Primer
- Black Marker
- Ruler

* NOT INCLUDED; Refer to Nipple Price Schedule (NPL-1)

Use the Schedule 80 pipe size listed for the appropriate valve size										
Valve Size (in.)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6
Required Sch 80 Pipe Size	**3/4**			**1**					**1-1/2**	
To calculate the length of Schedule 80 pipe needed, ***subtract*** the appropriate figure shown below from the desired handle height										
For True Union 2000 Industrial Ball Valves[1]										
Valve Size (in.)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6
Subtract (in.)	**3-7/8**	**4**	**5-5/8**	**5**	**5-5/8**	**6-1/4**	**8-1/16**	**8-1/16**	**9-5/8**	**10-11/16**
Minimum Height (in.)	4-9/16	5-3/16	5-1/2	6-3/4	7-3/8	8	9-13/16	9-13/16	11-5/8	12-3/4
For True Union 2000 Standard, Compact 2000 & Single Entry Ball Valves										
Valve Size (in.)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	N/A
Subtract (in.)	**2-1/2**	**3-1/16**	**3-9/16**	**4-1/4**	**4-5/8**	**5-11/16**	**7-11/16**	**7-11/16**	**9**	N/A
Minimum Height (in.)	3-5/8	4-1/4	4-3/4	6	6-3/8	7-7/16	9-1/2	9-1/2	11	N/A
For Regular True Union & Compact Ball Valves										
Valve Size (in.)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	N/A
Subtract (in.)	**3-5/16**	**4**	**4-5/16**	**5-1/8**	**5-5/8**	**6-1/16**	**7-1/8**	**7-1/8**	**8-3/8**	N/A
Minimum Height (in.)	4-1/2	5-1/4	5-1/2	7	7-1/2	8	9	9	10-1/2	N/A

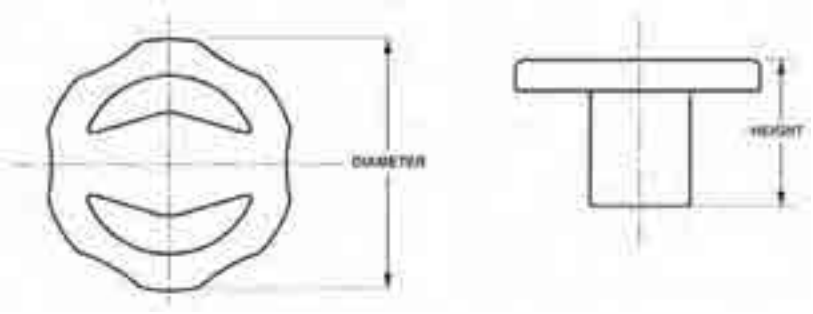
1: Stem Extension does not permit use of Handle Lockout on True Union 2000 Industrial Ball Valves.

BALL VALVE ACCESSORIES

Round Safety Handles

- Handles for True Union 2000 Valves and for Regular True Union, Single Entry or Compact Ball Valves
- Helps prevent accidental operation of valve
- Special design provides positive hand grip
- Impact and corrosion resistant Polypropylene construction

Note: Round Handle does not allow use of Handle Lockout on True Union 2000 Industrial Ball Valve. Not for use on True Union 2000 Industrial 3-Way Ball Valve.



Valve Size	Part Numbers		Handle Height	Handle Diameter
	For True Union 2000, Compact 2000 & Single Entry Ball Valves	For Regular True Union & Compact Ball Valves		
1/2	18-24-00528	99-24-00528	1-13/32	2-1/2
3/4	18-24-00728	99-24-00728	1-9/16	2-7/8
1	18-24-01028	99-24-01028	1-9/16	3-1/4
1-1/4	18-24-01228	99-24-01228	1-13/16	3-9/16
1-1/2	18-24-01528	99-24-01528	1-15/16	4-3/16
2	18-24-02028	99-24-02028	2-1/4	5-1/16
2-1/2 & 3	18-24-30280	99-24-03028	2-3/4	6-11/16
4	18-24-04028	99-24-04028	3	8-1/8

Typical Application (VALVE NOT INCLUDED)

2" Square / T-Style Operator Nuts

- Operator Nuts for True Union 2000 Valves and for Regular True Union, Single Entry or Compact Ball Valves
- Designed for use with standard 2" square drive or conventional "T" drive operators

Note : Not for use on True Union 2000 Industrial 3-Way Ball Valves

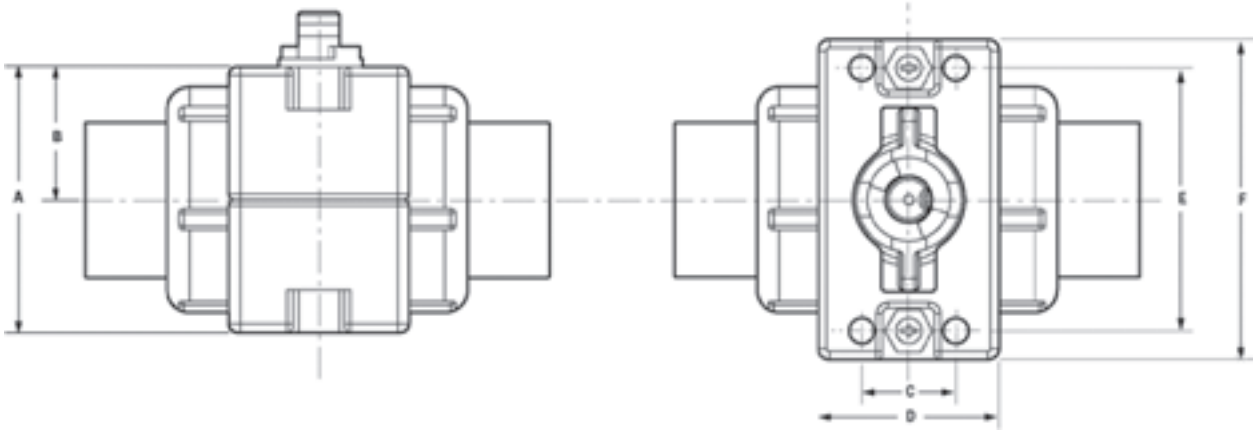
Valve Size	Part Numbers		
	All True Union (Reg./2000) Compact, Compact 2000 & Single Entry Ball Valves	For True Union 2000 Industrial, Standard & Single Entry Ball Valves	For Regular True Union & Compact Ball Valves
1/2	VTN2-005	N/A	N/A
3/4	VTN2-007		
1	VTN2-007		
1-1/4	VTN2-012		
1-1/2	VTN2-015		
2	VTN2-020		
2-1/2 & 3	N/A	VTN2-030	VTN-030
4		VTN2-040	VTN-040

Multi-Mount Valve Mounting Brackets

- Separate Brackets for True Union 2000 Industrial & Standard Ball Valves and for Regular True Union Ball Valves.
- Provides solid, versatile valve mounting to machinery supports, panels, etc.
- Simple 2-piece clamp-on unit allows quick removal of valve for maintenance or servicing without altering position.
- Includes mounting hardware.
- Impact and corrosion resistant Polypropylene construction.
- Easily adapts to actuator mount using optional Multi-Mount Actuator Mounting Platform.

Notes: 1) Bracket does not fit True Union 2000 Industrial 3-Way Ball Valves.

2) True Union 2000 Valve brackets come with SS 316 hardware, Regular True Union brackets come with zinc-plated steel hardware.



Multi-Mount Valve Mounting Brackets

True Union 2000 Ball Valve

Valve Size	Part Number	Dimensions					
		A	B	C	D	E	F
1/2	TUMB2-005	2.38	1.19	1.04	1.72	2.46	3.54
3/4	TUMB2-007	2.70	1.35	1.10	1.81	2.75	3.54
1	TUMB2-010	2.96	1.48	1.04	2.00	2.90	3.54
1-1/4	TUMB2-012	3.60	1.80	1.25	2.00	3.50	4.13
1-1/2	TUMB2-015	4.00	2.00	1.38	2.15	3.90	4.53
2	TUMB2-020	4.62	2.31	1.50	2.50	4.50	5.10
2-1/2 & 3	TUMB2-030	6.20	3.10	2.00	3.25	6.25	7.03
4	TUMB2-040	8.16	4.08	2.00	4.10	7.72	8.50

Regular True Union Ball Valve

Valve Size	Part Number	Dimensions					
		A	B	C	D	E	F
1/2	TUMB-005	2.92	1.46	0.68	1.55	2.25	4.44
3/4	TUMB-007	3.54	1.77	0.94	1.87	2.55	4.87
1	TUMB-010	3.56	1.78	1.05	2.00	2.87	5.12
1-1/4	TUMB-012	3.98	1.99	1.19	2.09	3.25	5.31
1-1/2	TUMB-015	4.54	2.27	1.47	2.47	3.84	5.90
2	TUMB-020	5.56	2.78	1.81	2.75	4.75	7.00
2-1/2 & 3	TUMB-030	7.54	3.77	2.47	3.75	6.84	9.47
4	TUMB-040	9.16	4.58	2.72	4.19	8.28	11.41

BALL VALVE ACCESSORIES

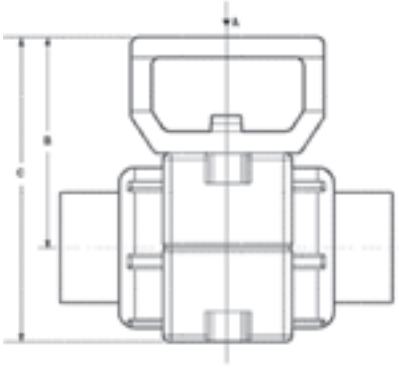
Valve Size	Part Numbers	
	For True Union 2000 Ball Valves	For Regular True Union Ball Valves
1/2	MMP1-005	MMP-005
3/4	MMP1-007	MMP-007
1	MMP1-010	MMP-010
1-1/4	MMP1-012	MMP-012
1-1/2	MMP1-015	MMP-015
2	MMP1-020	MMP-020
2-1/2 & 3	MMP1-030	MMP-030
4	MMP1-040	MMP-040

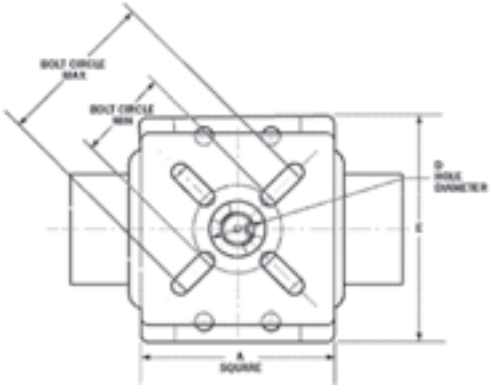
- Separate Platforms for True Union 2000 Valves and for Regular True Union Ball Valves.
- Add-on actuator adapter for use with Multi-Mount Valve Mounting Bracket (may also be purchased with bracket as complete kit).
- Universal actuator mounting accepts ISO, MSS or comparable square bolt-pattern actuators.
- Impact and corrosion resistant Polypropylene construction.
- Includes hardware for mounting Platform to Bracket

Complete Multi-Mount Actuation Mounting Kits

- Separate Platforms for True Union 2000 Industrial Ball Valves & for True Union 2000 Standard Ball Valves and for Regular True Union Ball Valves.
- Combines Multi-Mount Valve Mounting Bracket and Multi-Mount Actuator Mounting Platform into one complete kit.
- Provides solid, fully supported valve and actuator mounting.
- Impact and corrosion resistant Polypropylene construction.
- Bracket and platform hardware included

NOTES: 1) True Union 2000 Valve kits come with SS 316 hardware, Regular True Union kits come with zinc-plated steel hardware.
2) Does not fit True Union 2000 Industrial 3-way Ball Valves
3) Actuator coupling not included (see Valve Stem Output Detail for design of user supplied drive coupling).





Valve Size	True Union 2000 Ball Valves	Regular True Union Ball Valves	Dimensions									
			A	TU 2000 B	Reg. TU B	TU 2000 C	Reg. TU C	D	TU 2000 E	Reg. TU E	Bolt Circle Max	Bolt Circle Min.
1/2	TUAK1-005	TUAK-005	3.00	3.00	3.31	4.19	4.58	.87	3.54	4.44	2.50	1.41
3/4	TUAK1-007	TUAK-007	3.00	3.06	3.50	4.41	5.17	.87	3.54	4.84	2.50	1.41
1	TUAK1-010	TUAK-010	3.00	3.23	3.63	4.77	5.31	.87	3.54	5.06	2.50	1.41
1-1/4	TUAK1-012	TUAK-012	3.75	4.64	4.76	6.44	6.70	.90	4.13	5.31	3.00	1.41
1-1/2	TUAK1-015	TUAK-015	3.75	5.02	5.25	7.02	7.43	.90	4.63	5.90	3.00	1.41
2	TUAK1-020	TUAK-020	3.75	5.33	5.76	7.65	8.43	1.12	5.56	7.02	3.12	1.75
2-1/2 & 3	TUAK1-030	TUAK-030	5.25	6.29	7.00	9.41	10.57	1.37	7.86	9.50	5.00	2.20
4	TUAK1-040	TUAK-040	5.25	7.96	8.50	12.06	12.75	1.37	9.44	11.50	5.00	2.20

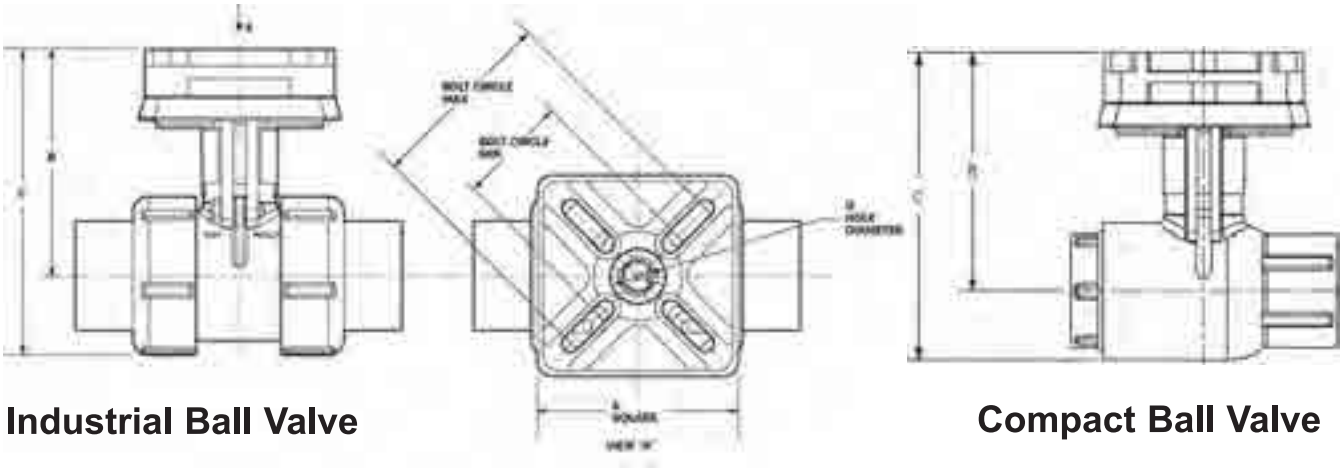
BALL VALVE ACCESSORIES

Mini-Mount Actuation Mounting Kits

- Separate kits for True Union 2000 Industrial & Industrial 3-Way Ball Valves and for True Union 2000 Standard Ball Valves.
- Simple bolt-on mount provides positive actuator support and alignment.
- Universal actuator mounting plate accepts ISO, MSS or comparable square bolt-pattern actuators.
- Impact and corrosion resistant Polypropylene construction
- Includes hardware for mounting to valve.

Notes: 1) True Union 2000 Valve kits come with SS 316 hardware, Regular True Union kits come with zinc-plated steel hardware.

2) Actuator coupling not included (see Valve Stem Output Detail for design of user supplied drive coupling).



Industrial Ball Valve **Compact Ball Valve**

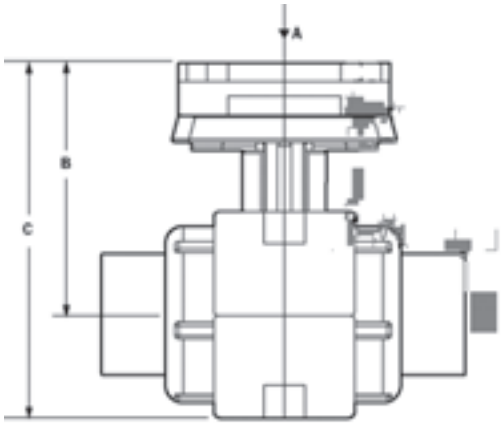
Valve Size	TU 2000 Ind Ball Valves	TU 2000 Std Ball Valves[1]	Compact 66-Series	Compact 21-Series	Dimensions									
					A	TU 2000 B	66 Series B	21 Series B	TU 2000 C	66 Series C	21 Series C	D	Bolt Circle Max.	Bolt Circle Min.
1/2	AMB2-005	AMB3-005		AMB4-005	3.18	2.95	2.95	3.07	3.88	3.66	3.92	0.87	3.00	1.62
3/4	AMB2-007	AMB3-007		AMB4-007	3.18	3.36	3.36	3.41	4.50	4.25	4.45	0.87	3.00	1.75
1	AMB2-010	AMB3-010		AMB4-010	3.18	3.60	3.60	3.58	4.87	4.62	4.77	0.87	3.00	1.75
1-1/4	AMB2-012	AMB3-012		AMB4-012	3.68	4.37	4.37	4.25	5.94	5.65	5.66	0.87	3.75	2.00
1-1/2	AMB2-015	AMB3-015		AMB4-015	3.68	4.64	4.64	4.52	6.42	6.12	6.13	0.87	3.75	2.00
2	AMB2-020	AMB3-020		AMB4-020	3.68	5.47	5.47	5.32	7.61	7.26	7.38	1.12	3.75	2.50
2-1/2 & 3	AMB2-030	AMB3-030	N/A	AMB4-030	5.25	6.10	N/A	5.64	9.18	N/A	8.64	1.96	5.62	4.50
4	AMB2-040	AMB3-040	N/A	AMB4-040	5.75	6.92	N/A	6.56	10.78	N/A	10.24	2.62	5.88	4.80
6	AMB2-060	N/A	N/A	AMB2-060	5.75	8.31	N/A	8.31	14.12	N/A	13.39	2.88	5.88	4.85

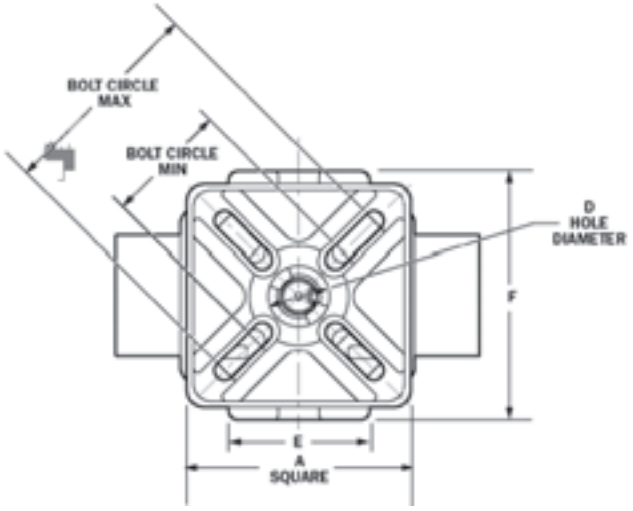
1: Centerline height also applies to Single Entry and Compact Ball Valves

Mini-Mount Combo Actuation Mounting Kits

- Separate, complete actuation mounting kit specially designed for True Union 2000 Industrial Ball Valve and for True Union 2000 Standard Ball Valve.
- Combines Multi-Mount Bracket with Mini-Mount Actuation Mounting Kit for additional mounting support.
- Universal actuator mounting plate accepts ISO, MSS or comparable square bolt-pattern actuators.
- Impact and corrosion resistant Polypropylene construction
- Includes SS 316 hardware for mounting to valve.

Notes: 1) Does not fit True Union 2000 Industrial 3-way Ball Valves
2) Actuator coupling not included (see Valve Stem Output Detail for design of user supplied drive coupling).

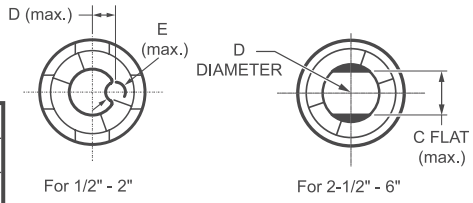




Valve Size	True Union 2000 Industrial Ball Valves	True Union 2000 Standard Ball Valves	Dimensions							
			A	B	C	D	E	F	Bolt Circle Max.	Bolt Circle Min.
1/2	TUAK2-005	TUAK3-005	3.00	2.95	4.14	.87	1.72	3.54	3.00	1.62
3/4	TUAK2-007	TUAK3-007	3.00	3.36	4.71	.87	1.81	3.54	3.00	1.75
1	TUAK2-010	TUAK3-010	3.00	3.60	5.07	.87	2.00	3.54	3.00	1.75
1-1/4	TUAK2-012	TUAK3-012	3.50	4.37	6.17	.87	2.00	4.13	3.75	2.00
1-1/2	TUAK2-015	TUAK3-015	3.50	4.64	6.64	.87	2.15	4.53	3.75	2.00
2	TUAK2-020	TUAK3-020	3.50	5.47	7.79	1.12	2.50	5.10	3.75	2.50
2-1/2 & 3	TUAK2-030	TUAK3-030	5.00	6.10	9.22	1.96	3.25	7.00	5.62	4.50
4	TUAK2-040	TUAK3-040	5.50	6.92	11.02	2.68	4.10	8.50	5.88	4.80

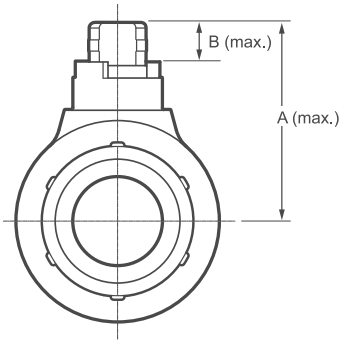
BALL VALVE ACCESSORIES

Valve Stem Output Detail



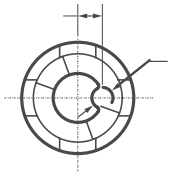
For Regular True Union & Compact Ball Valves

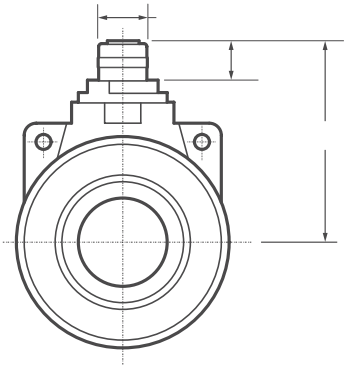
Size	A (max.)	B (max.)	C Flat (max.)	D	C (max.)	D (max.	E (max.
1/2	1.48	.31	N/A	N/A	.52	.26	.30
3/4	1.88	.35			.56	.28	.30
1	2.18	.48			.62	.31	.33
1-1/4	2.66	.66			.56	.28	.32
1-1/2	2.87	.67			.75	.37	.38
2	3.60	.89			.95	.47	.44
2-1/2 & 3	4.86	1.01	1.21	1.48	N/A	N/A	N/A
4	6.24	1.33	1.92	2.12			
6	7.53	1.33	1.92	2.12			



For All True Union 2000, Compact 2000, & Single Entry Ball Valves

Size	A (max.)	B (max.)	C (max.)	D (max.)	E (max.)	Flat (max.)
1/2	1.43	.26	.52	.26	.30	N/A
3/4	1.79	.33	.56	.28	.30	
1	2.10	41	.62	.31	.33	
1-1/4	2.61	.55	.56	.28	.32	
1-1/2	2.87	.62	.75	.37	.38	
2	3.52	.65	.95	.47	.44	
2-1/2 & 3	5.28	1.16	1.28	.63	.56	
4	5.81	.91	1.86	.93	.75	
6	7.53	1.33	2.12	N/A	N/A	1.92

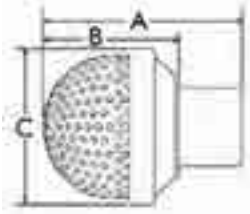




Foot Valve Screens

- Easily converts Ball Check Valve to a Foot Valve.
- Standard IPS spigot connection fits slip-socket valve end connector.
- Enlarged screen provides open area equivalent to valve for optimum flow characteristics.
- Chemical and corrosion resistant PVC or CPVC construction.

Typical Application (VALVE NOT INCLUDED)



Dimensions

Size	Part Number		A	B	C
	PVC	CPVC	±1/16	±1/32	±1/16
1/2	FVS-005	FVS-005C	3-7/16	2-1/2	2-1/4
3/4	FVS-007	FVS-007C	3-1/2	2-7/16	2-5/16
1	FVS-010	FVS-010C	3-5/8	2-9/16	2-5/8
1-1/4	FVS-012	FVS-012C	3-7/8	2-9/16	2-5/8
1-1/2	FVS-015	FVS-015C	5-15/32	4-1/64	4-7/16
2	FVS-020	FVS-020C	5-1/2	4-1/64	4-7/16
2-1/2	FVS-025	FVS-025C	6-7/16	4-3/4	5-5/8
3	FVS-030	FVS-030C	6-5/8	4-3/4	5-11/16
4	FVS-040	FVS-040C	6-29/32	4-3/4	5-3/4
6	FVS-060	FVS-060C	7-3/8	4-11/16	7-3/16

NEEDLE VALVES

Features … PVC, CPVC & PP

Needle Valves provide proportional opening to needle travel for more accurate metering applications and other fine adjustment flow control applications. Special design PTFE seal eliminates elastomer type seals or O-rings that can contribute to chemical compatibility problems. PVC, CPVC and Polypropylene valves are available with 1/4", 3/8" and 1/2" NPT female threaded ends in either standard Globe Pattern or special Angle Pattern configuration that eliminates need for additional elbow in various system setups.

- € Chemical & Corrosion Resistant PVC, CPVC or PP Construction
- € Precision Metering Chamber
- € Globe & Angle Body Configurations
- € Removable Bonnet For Easy Disassembly & Cleaning
- € Solid PTFE Stem Seal - No Elastomer Seal or Lubricants Used
- € Built-in Panel or Bracket Mounting Nut
- € Easy-Grip Polypropylene Handle
- € PVC & CPVC Pressure Rated to 235 psi @ 73°F
  Polypropylene Pressure Rated to 150 psi @ 73°F

Sample Engineering Specification

All thermoplastic Needle Valves shall be constructed from PVC, ASTM D 1784 Cell Classification 12454, CPVC, ASTM D 1784 Cell Classification 23447, or Polypropylene, ASTM D 4101. All valves shall be globe pattern or angle pattern body configuration with 1/4", 3/8" or 1/2" female NPT end connections. All valves shall have removable bonnet cap with replaceable PTFE seal. No elastomer seals shall be used. All valves shall have built-in panel mounting nut and high impact polypropylene handles. All PVC and CPVC valves shall be pressure rated to 235 psi and all Polypropylene valves to 150 psi for water @ 73°F, as manufactured by Spears® Manufacturing Company.

Cv Values

Size	Globe Pattern	Angle Pattern
1/4" - 3/8"	.310	.426
1/2"	.62	.78

Gallons per minute at 1 psi pressure drop.

Quick-View Needle Valve Selection Chart

Valve Size	PVC Part Numbers[1,2]						Pressure Rating
	Globe Pattern			Angle Pattern			
	Socket	SR Threaded	Threaded	Socket	SR Threaded	Threaded	
1/4"	5592-002	N/A	5591-002	5692-002	N/A	5691-002	PVC & CPVC 235 psi, PP 150 psi Non-Shock Water @ 73°F
3/8"	5592-003	N/A	5591-003	5692-003	N/A	5691-003	
1/2"	5592-005	5591-005SR	5591-005	5692-005	5691-005SR	5691-005	

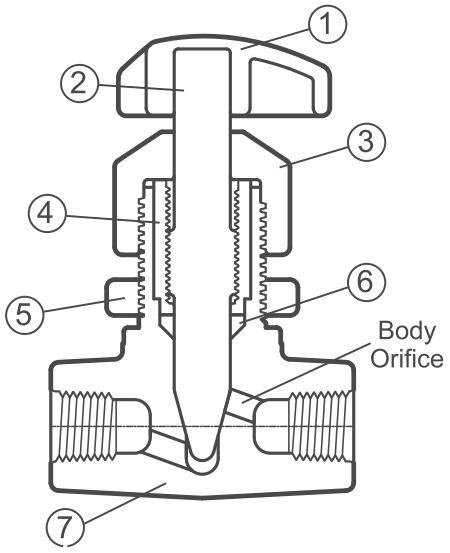
1: For CPVC Valve, add the letter □CŽ to the part number (e.g. 5591-00**2**)
2: For threaded Polypropylene Valve, add the letter □PŽ to the part number (e.g. 5591-00**2**, 5591-005**P**SR)

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/4"-1/2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
		PP	150	105	90	80	65	50	45	30	20	-0-	-0-	-0-

Panel Mounting Instructions

Spears® Needle Valves may be easily mounted to panel or bracket ranging from 3/16" to 1/2" in thickness using the accompanying template. Prepare mounting hole to panel opening dimensions. Slots may be cut in various positions to allow more versatile orientation. Open valve partially. Remove Bonnet Cap with needle assembly (do not fully disassemble) and Panel Nut from valve body. Insert valve body through mounting hole and seat lugs. Reinstall Panel Nut and tighten snug. Carefully reinstall Bonnet Cap and needle assembly, tighten snug. ***Caution:*** *failure to partially open the valve or back the needle off prior to re-assembly may damage needle when tightening Bonnet Cap.*



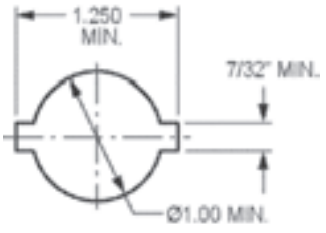
Replacement Parts

No.	Component	Qty.	Material
1	Handle	1	PP
2	Needle Stem	1	PVC/CPVC/PP
3	Bonnet Cap	1	PVC/CPVC/PP
4	Stem Nut	1	GFPP
5	Panel Nut	1	PVC/CPVC/PP
6	Seal	1	PTFE
7	Body	1	PVC/CPVC/PP

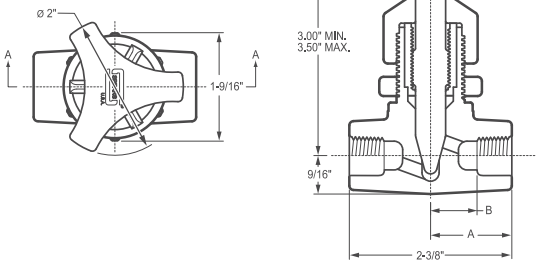
Body Orifice Dimensions

Valve Size	Body Orifice Ø
1/4	3/16"
3/8	3/16"
1/2	1/4"

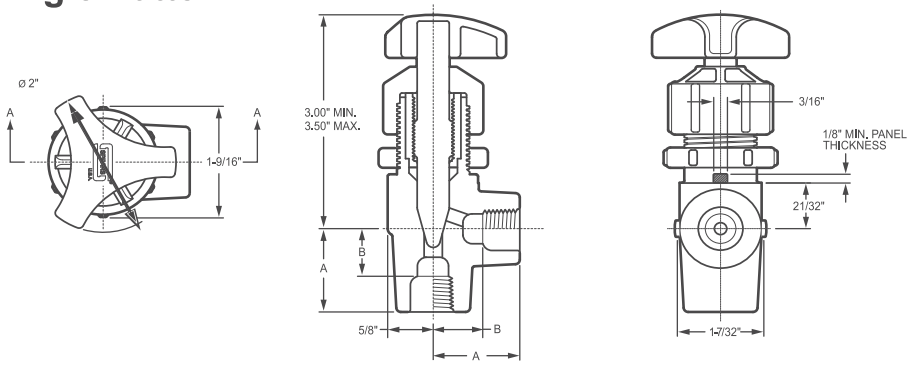
Panel Opening



Globe Pattern



Angle Pattern



Dimensions

Valve Size	End Connection	A	B
1/4	Threaded	1-3/16	21/32
	Socket		9/16
3/8	Threaded		9/16
	Socket		7/16
1/2	Threaded	1-3/8	21/32
	Socket		1/2

Threaded Valve Dimensions apply to both Standard and SR Threads.

GATE VALVES

Features – PVC, CPVC

This solid, proven design is well suited for a variety of chemical, industrial and irrigation applications. Spears® Gate Valves are feature-packed with a variety of end connector options. Individual special features are found in each size range 1/2" through 2", 2-1/2" & 3", and in the full featured Heavy Industrial 4" valve. See Spears® Plug Gate Valves for 6" size.

- Heavy Bodied PVC & CPVC Construction
- Tapered Wedge with Specially Designed Sealing Surface
- Non-Rising Stem Design
- Patented Strain-Equalizing Stem/Wedge Thread
- O-ring Stem Seals Instead of Packing - No Retightening Required
- Buna-N, EPDM, or Viton® O-ring Seals
- Positive Grip, High Impact Polypropylene Handwheel Operator
- Fully Serviceable, Replaceable Components - Accessible Without Valve Removal
- NSF Certified for Potable Water use
- Suitable for Vacuum Service
- Assembled with Silicone-Free, Water Soluble Lubricants
- Metric Socket and BSP Thread Available, 1/2" - 2"

1/2" - 2" PVC & CPVC Heavy Duty Gate Valves

- Available with socket, threaded or flanged end connectors.
- Pressure rated to 200 psi @ 73°F. Flanged Valve Pressure Rated to 150 psi @ 73°F

2-1/2" & 3" PVC & CPVC Heavy Duty Gate Valves

- Available with socket, SR (Special Reinforced) threaded or flanged end connectors.
- Pressure rated to 150 psi @ 73°F.
- Optional 2" Square/T-Style Operator Nut available.

Note: 2-1/2" size is a bushed down 3" valve.

4" PVC & CPVC Heavy Industrial Gate Valves

- Available with socket, SR (Special Reinforced) threaded or flanged end connectors.
- Pressure rated to 235 psi @ 73°F. Flanged Valve Pressure Rated to 150 psi @ 73°F
- SS 316 Exterior Bonnet & Hardware
- Built-in Quick-View Position Indicator
- Optional 2" Square/T-Style Operator Nut available.

Sample Engineering Specification

All thermoplastic Gate Valves shall be constructed from PVC Type I Cell Classification 12454 or CPVC Type IV Cell Classification 23447. All O-rings shall be Buna-N, EPDM or Viton®. All valves shall have non-rising stem and Polypropylene handwheel. All valve gate wedges shall have Strain-Equalizing threads. PVC valves shall have Polypropylene wedge and CPVC valves shall have CPVC wedge. All valve components shall be replaceable. All 1/2" through 2" valves shall be pressure rated at 200 psi, all 2-1/2" through 3" valves shall be pressure rated at 150 psi, and all 4" valves shall be pressure rated at 235 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.

Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Part Numbers[1]			Pressure Rating
		Socket	Threaded	Flanged	
1/2	Buna-N	2012-005	2011-005	2013-005	200 psi Non-Shock Water @ 73°F (Flanged 150 psi Non-Shock Water @ 73°F)
	EPDM	2022-005	2021-005	2023-005	
	Viton®	2032-007	2031-005	2033-005	
3/4	Buna-N	2012-007	2011-007	2013-007	
	EPDM	2022-007	2021-007	2023-007	
	Viton®	2032-007	2031-007	2033-007	
1	Buna-N	2012-010	2011-010	2013-010	
	EPDM	2022-010	2021-010	2023-010	
	Viton®	2032-010	2031-010	2033-010	
1-1/4	Buna-N	2012-012	2011-012	2013-012	
	EPDM	2022-012	2021-012	2023-012	
	Viton®	2032-012	2031-012	2033-012	
1-1/2	Buna-N	2012-015	2011-015	2013-015	
	EPDM	2022-015	2021-015	2023-015	
	Viton®	2032-015	2031-015	2033-015	
2	Buna-N	2012-020	2011-020	2013-020	
	EPDM	2022-020	2021-020	2023-020	
	Viton®	2032-020	2031-020	2033-020	
2-1/2	Buna-N	2012-025[3]	2011-025[3]	2013-025[3]	150 psi Non-Shock Water @ 73°F
	EPDM	2022-025[3]	2021-025[3]	2023-025[3]	
	Viton®	2032-025[3]	2031-025[3]	2033-025[3]	
3	Buna-N	2012-030	2011-030SR	2013-030	
	EPDM	2022-030	2021-030SR	2023-030	
	Viton®	2032-030	2031-030SR	2033-030	
4	Buna-N	2012-040	2011-040SR	2013-040	235[2] psi Non-Shock Water @ 73°F
	EPDM	2022-040	2021-040SR	2023-040	
	Viton®	2032-040	2031-040SR	2033-040	

1: For CPVC valves, add the letter "C" to the part numbers (e.g., 2031-005**C**).

2: Flanged end connectors have a Maximum Internal Pressure Rating of 150 psi @ 73°F.

3: Outlet sized with bushing.

C_V Values

Nominal Size	Cv[1] Gallons/Minute	
	Socket/Threaded	Flanged
1/2	19	15
3/4	37	29
1	44	39
1-1/4	128	105
1-1/2	144	127
2	333	279
2-1/2	See Note 2	
3	335	323
4	583	566

Flanged valves calculated for additional laying length of flanged valve.

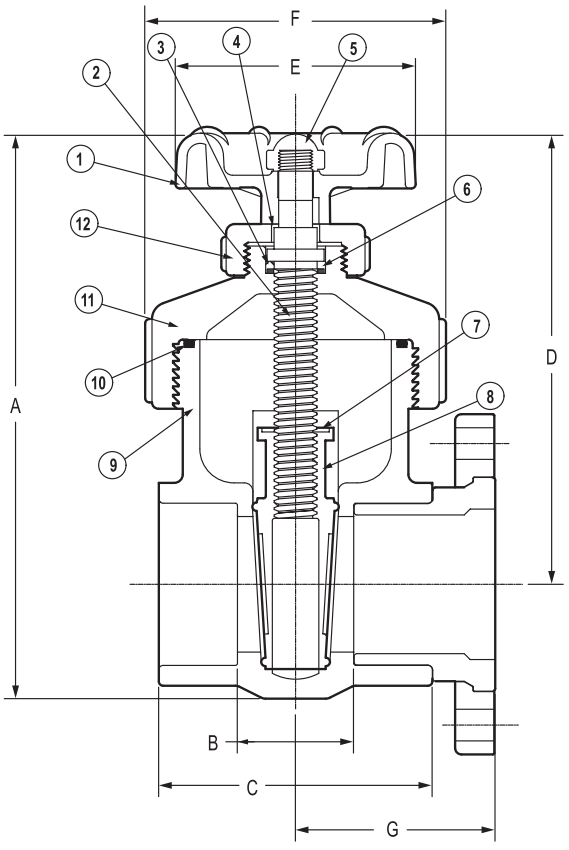
1: Gallons per minute at 1 psi pressure drop.

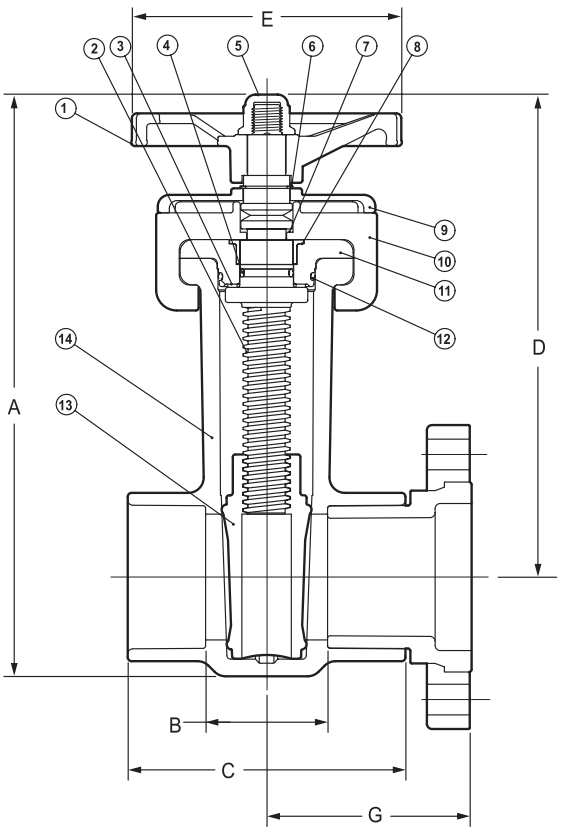
2: Size 2-1/2" is a reducer bushed down 3" valve, C_v not available.

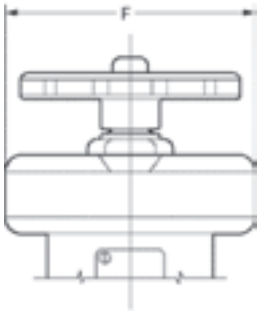
Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2"-2"	PVC	200 (1.38)	135 (.93)	120 (.83)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	200 (1.38)	155 (1.07)	140 (.97)	125 (.86)	110 (.76)	100 (.69)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	2-1/2"-3"	PVC	150 (1.03)	130 (.90)	110 (.76)	60 (.41)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.69)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	4"	PVC	235 (1.62)	140 (.97)	130 (.90)	90 (.62)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	95 (.66)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

NOT FOR USE WITH COMPRESSED AIR OR GASES





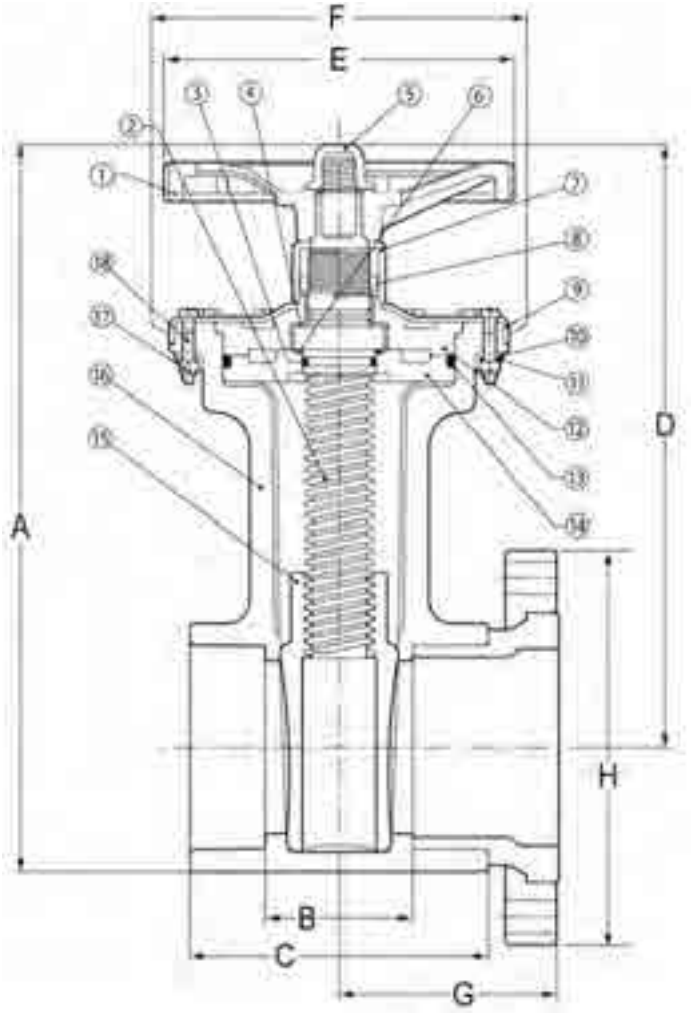


1/2" - 2" Replacement Parts

No.	Component	Qty.	Material
1	Handle	1	PP
2	Stem	1	PVC/CPVC
3	Stem O-ring	1	Buna-N/EPDM/Vition®
4	Stem Bushing	1	PP
5	Stem Nut	1	PVC/CPVC
6	Stem Washer	1	PP
7	Wedge Washer/O-ring	1	Buna-N/EPDM/Vition®
8	Wedge	1	PP/CPVC
9	Body (Socket/Threaded)	1	PVC/CPVC
10	Bonnet O-ring	1	Buna-N/EPDM/Vition®
11	Bonnet	1	PVC/CPVC
12	Bonnet Nut	1	PVC/CPVC

2-1/2" & 3" Replacement Parts

No.	Component	Qty.	Material
1	Handle	1	PP
2	Stem	1	PVC/CPVC
3	Stem Bearing	1	PP
4	Stem O-ring	1	Buna-N/EPDM/Vition®
5	Stem Nut	1	PVC
6	Stem Retaining Ring	1	SS 316
7	Split Washer	1	PP
8	Stem Bushing	1	PP
9	Bonnet Retainer	1	PVC/CPVC
10	Bonnet Half	2	PVC/CPVC
11	Seal Carrier	1	PVC/CPVC
12	Carrier O-ring	1	Buna-N/EPDM/Vition®
13	Wedge	1	PP/CPVC
14	Body	1	PVC/CPVC



4" Replacement Parts

No.	Component	Qty.	Material
1	Handle	1	PP
2	Stem	1	PVC/CPVC
3	Stem O-ring	1	Buna-N/EPDM/Vition®
4	Stem Bushing	1	Poly Teflon®
5	Stem Nut	1	PVC/CPVC
6	Stem Washer	1	PP
7	Indicator Cover	1	PVC Clear
8	Indicator Nut	1	PP Yellow
9	Bonnet Retainer	1	SS 316
10	Retainer Bracket	2	SS 316
11	Bracket Lock	1	SS 316
12	Bonnet	1	PVC/CPVC
13	Seal Carrier O-ring	1	Buna-N/EPDM/Vition®
14	Seal Carrier	1	PVC/CPVC
15	Wedge	1	PP/CPVC
16	Body	1	PVC/CPVC
17	Locknut	12	SS 316
18	Hex Bolt	12	SS 316

Dimensions & Weights

Nominal Size	Dimension Reference (inches, ± 1/16)								Approx. Wt. (Lbs.)			
	A	B[1]	C	D	E	F	G	H	PVC		CPVC	
									Soc/Thd	Flanged	Soc/Thd	Flanged
1/2	5-1/8	1-1/4	2-13/16	4-1/8	2-5/8	2-11/16	2-3/16	3-1/2	.51	.92	.56	.98
3/4	5-1/8	1-1/4	2-13/16	4-1/8	2-5/8	2-11/16	2-1/4	3-7/8	.52	1.09	.57	1.16
1	5-13/32	1-1/4	3-5/16	4-5/16	2-5/8	2-15/16	2-11/16	4-1/4	.67	1.46	.73	1.54
1-1/4	8-1/16	1-9/16	3-9/16	6-5/8	3-7/16	3-15/16	2-3/4	4-5/8	1.61	2.58	1.73	2.74
1-1/2	8-1/16	1-9/16	3-9/16	6-1/2	3-7/16	3-15/16	3-7/16	5	1.63	2.81	1.75	3.03
2	9-13/16	1-7/8	3-15/16	6-15/16	3-7/16	4-7/16	3-5/8	6	1.95	3.81	2.15	4.09
2-1/2	14-5/16	3-9/16	7-11/16	12-1/16	6-11/16	7-1/4	5-1/8	7-1/2	9.48	11.91	9.60	12.89
3	14-5/16	2-15/16	6-11/16	12-1/16	6-11/16	7-1/4	4-15/16	7-1/2	9.03	12.21	9.43	13.40
4	16	3-3/8	7-15/16	13-1/4	8	7-9/16	5-9/16	9	13.67	18.39	14.66	19.75

1: Valve Lay Length

2" Square / T-Style Operator Nuts

- Fits Spears® Gate Valves.
- Combination design for use with either standard 2" square drive or conventional “T” drive operators.

Size	Part Number
1/2, 3/4, 1	GTN-005
1-1/4, 1-1/2, 2	GTN-012
2-1/2 & 3	GTN-030
4	GTN-040

GLOBE VALVES

Sample Engineering Specification

All thermoplastic Globe valves shall be constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D1784 Cell Classification 23447. All seals shall be EPDM or Viton®. All valves shall have a high impact polypropylene handwheel. All PVC and CPVC 2-1/2" through 6" valves shall be pressure rated to 150 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.

Features - PVC, CPVC

Spears® Globe Valves provide close throttling control throughout the entire range of operation through positive shutoff. This makes the Globe Valve an excellent choice for throttling applications where pressure drop is not critical. Valves are available in PVC and CPVC materials in larger IPS sizes of 2-1/2" through 6" with Flanged end connections.

- Excellent Throttling Characteristics
- Chemical & Corrosion Resistant PVC or CPVC Construction … No Wetted Metal Parts
- Fully Serviceable In-line with Factory Assembled Internal Repair Kit
- EPDM or Viton® Seat & Seals
- Sizes 2-1/2" … 6" Pressure Rated to 150 psi @ 73°F
- Suitable for Vacuum Service
- Assembled with Silicone-Free, Water Soluble Lubricants

Quick-View Valve Selection Chart

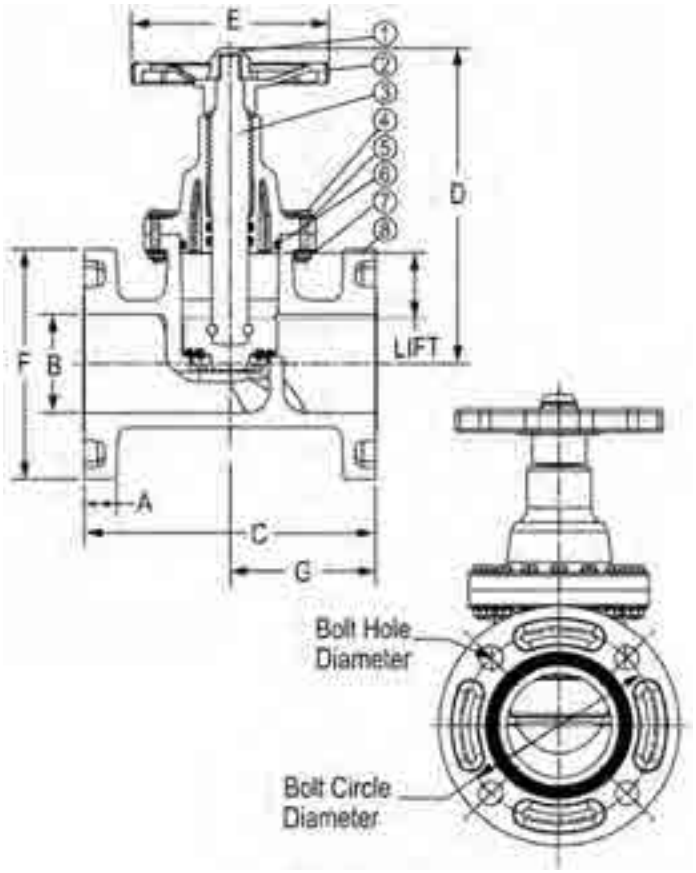
Valve Size	Seals	PVC Part Numbers[1]	Pressure Rating
		Flanged	
2-1/2	EPDM	6023-025	150 psi Non-Shock Water @ 73°F
	Viton®	6033-025	
3	EPDM	6023-030	
	Viton®	6033-030	
4	EPDM	6023-040	
	Viton®	6033-040	
6	EPDM	6023-060	
	Viton®	6033-060	

1: For CPVC Globe Valves, add the letter "C" to the part number listed (e.g; 6023-025**C**).

Globe Valve Internal Repair Kit

Internal Repair Kit includes: Bonnet O-ring (1) along with a factory assembled (required) internal component replacement unit consisting of Bonnet assembled with Stem O-rings, Seat and Seal Carrier components. Install in valve using existing valve Bolts, Nuts, Washers and Handle Nut.

Valve Size	Part Number			
	EPDM O-ring	CPVC w/ EPDM O-ring	Viton® O-ring	CPVC w/ Viton® O-ring
2-1/2	GL-ERK-025	GL-ERK-025C	GL-VRK-025	GL-VRK-025C
3	GL-ERK-030	GL-ERK-030C	GL-VRK-030	GL-VRK-030C
4	GL-ERK-040	GL-ERK-040C	GL-VRK-040	GL-VRK-040C
6	GL-ERK-060	GL-ERK-060C	GL-VRK-060	GL-VRK-060C



Replacement Parts

NO.	COMPONENT	QTY.	MATERIAL
1	Handle Nut	1	PVC
2	Handle	1	PP
3	Stem Assembly[1]	1	PVC/CPVC; BUNA-N/EPDM/VITON®
4	Hex Bolt	1	SS 316
5	Flat Washer	1	SS 316
6	Bonnet O-ring	1	BUNA-N/EPDM/VITON®
7	Hex Nut	1	SS 316
8	Body	1	PVC/CPVC

1 - Stem Assembly Includes: Stem (1), Bonnet (1), Stem O-rings (2), Dowel Pins (2), Dowel Pin Plugs (2), Seal Carrier (1), Seat (1), Seat Retainer (1)

C_V Values

Nominal Size	C_V[1]
2-1/2	62
3	85
4	125
6	221

1: Gallons per minute at 1 psi pressure drop.

Dimensions

Nominal Size	A	B	C	D (Open)	E	F	G	LIFT	Bolt Circle Diameter	Bolt Hole Diameter	Number of Bolt Holes
2-1/2	1-1/16	3-1/4	9-1/2	12-1/2	6-9/16	7-1/2	4-3/4	2-1/8	5-1/2	3/4	4
3	1-1/16	3-1/4	9-1/2	12-1/2	6-9/16	7-1/2	4-3/4	2-1/8	6	3/4	4
4	1-1/8	4-1/4	11-1/2	13-1/4	11	9	5-3/4	2-3/16	7-1/2	3/4	8
6	1-1/4	6-5/16	16-1/4	17-7/8	11	11	8-1/8	3-1/4	9-1/2	7/8	8

Temperature Pressure Rating

System Operating Temperature °F (°C)		73 (23)	100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66	160 (71)	170 (77)	180 (82)	190 (88)
Valve Pressure Rating psi (MPa)	PVC	150 (1.03)	124 (.85)	100 (.69)	75 (.52)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
	CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.69)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	-0- (-0-)

Standard & True Lug Design

Lever Handle

True Lug

Gear Operating

Lug Insert Style

Sample Engineering Specification

All thermoplastic valves shall be Butterfly type constructed from PVC Type I Cell Classification 12454 or CPVC Type IV Cell Classification 23447. All valve seats and O-rings shall be Buna-N, EPDM or Viton®. Seat shall be a non-liner type interlocked to valve body. Bolt hole patterns shall conform to ANSI/ASME B16.5 Class 150. Disc shall be offset design with fully isolated Type 316L stainless steel stem and Type 316 stainless steel hardware. Lever operated valves shall be equipped with high impact polypropylene handle having built-in lockout capability. Gear operated valves shall be equipped with position indicator and high impact polypropylene handwheel. Valve bodies shall accept field installable lug inserts or shall be factory installed lug inserts, or be True Lug type. Lugs shall be stainless steel or zinc plated steel. Valves shall be pressure rated at 150 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.

Features - PVC, CPVC

Spears® patented Butterfly Valve design departs from traditional liner-seat type valve to eliminate seat creep, reduce operating torque and provide positive seal-off. Ideally suited for flow control or throttling, this high-performance valve is offered with a full variety of options for greater application versatility in industrial and chemical processing applications. Available in IPS sizes 1-1/2" - 12" in Standard or True Lug (factory installed lugs) style.

- Special off-set Disc lifts quickly from seat to reduce wear and reduce operating torque.
- Patented Limited Contact Seat design provides free travel - eliminates seat creep, extrusion and wear. Field replaceable without full valve disassembly.
- Interlocking Body & Seat prevents wash-out or blow-out.
- Buna-N, EPDM or Viton® Seat & Seals
- Fully Isolated Solid Type 316L Stainless Steel Stem
- Reversible High Impact Polypropylene Lever Handle with 7-Position stops & Built-in Lockout (standard handle on 1-1/2" - 8" valves; not available on 10" & larger valves)
- High Efficiency Gear Operator with Cast Aluminum Housing, Polypropylene Handwheel, and Built-in Position Indicator (available for all sizes; standard on 10" & larger valves)
- Lug Insert Style valve has factory installed SS316 or zinc plated lug inserts.
- Standard valve accepts field-installable Lug Inserts Set option
- True Lug design has factory installed zinc plated or SS 316 lugs and is specially designed for connection to either side of valve.
- Pressure Rated to 150 psi @ 73°F including Dead-End Service.
- ANSI/ASME B16.5 Class 150 Bolt Pattern
- Valves with EPDM Seals & Seats NSF Certified for Potable water use.

Optional Accessories

- Teflon® Coated Stem
- Stem Extension Kit
- PTFE Seat Sleeve
- Lever Handle Kit (standard on 1-1/2" - 8" valves)
- Gear Operator Kit (standard on 10" & larger valves)
- T-Handle Kit
- Field Installable Lug Insert Sets (for Standard valve)
- Speed Handle (for gear operated valves)
- 2" Square/T-Style Operator Nut (for gear operated valves)
- Chainwheel Operator Kit (for gear operated valves)
- Positive Stem Stop (for gear operated valves)
- Submersible Gear Operators

* See ***"BUTTERFLY VALVE ACCESSORIES"*** section for details of individual products.

Standard & Lug Insert Style Quick-View Valve Selection Chart

Valve Size	O-ring Material	STANDARD VALVE DESIGN PVC Part Number[1]			LUG INSERT VALVE DESIGN PVC Part Number[1] Installed with 316 Stainless Steel Lug Inserts[2]			Pressure Rating
		w/Lever Handle	w/Gear Operator	Valve Only	w/Lever Handle	w/Gear Operator	Valve Only	
1-1/2	Buna-N	721311-015	721321-015	721301-015	721311G-015	721321G-015	721301G-015	150 psi Non-Shock Water @ 73°F
	EPDM	722311-015	722321-015	722301-015	722311G-015	722321G-015	722301G-015	
	Viton®	723311-015	723321-015	723301-015	723311G-015	723321G-015	723301G-015	
2	Buna-N	721311-020	721321-020	721301-020	721311G-020	721321G-020	721301G-020	
	EPDM	722311-020	722321-020	722301-020	722311G-020	722321G-020	722301G-020	
	Viton®	723311-020	723321-020	723301-020	723311G-020	723321G-020	723301G-020	
2-1/2	Buna-N	721311-025	721321-025	721301-025	721311G-025	721321G-025	721301G-025	
	EPDM	722311-025	722321-025	722301-025	722311G-025	722321G-025	722301G-025	
	Viton®	723311-025	723321-025	723301-025	723311G-025	723321G-025	723301G-025	
3	Buna-N	721311-030	721321-030	721301-030	721311G-030	721321G-030	721301G-030	
	EPDM	722311-030	722321-030	722301-030	722311G-030	722321G-030	722301G-030	
	Viton®	723311-030	723321-030	723301-030	723311G-030	723321G-030	723301G-030	
4	Buna-N	721311-040	721321-040	721301-040	721311G-040	721321G-040	721301G-040	
	EPDM	722311-040	722321-040	722301-040	722311G-040	722321G-040	722301G-040	
	Viton®	723311-040	723321-040	723301-040	723311G-040	723321G-040	723301G-040	
6	Buna-N	721311-060	721321-060	721301-060	721311G-060	721321G-060	721301G-060	
	EPDM	722311-060	722321-060	722301-060	722311G-060	722321G-060	722301G-060	
	Viton®	723311-060	723321-060	723301-060	723311G-060	723321G-060	723301G-060	
8	Buna-N	721311-080	721321-080	721301-080	721311G-080	721321G-080	721301G-080	
	EPDM	722311-080	722321-080	722301-080	722311G-080	722321G-080	722301G-080	
	Viton®	723311-080	723321-080	723301-080	723311G-080	723321G-080	723301G-080	
10	Buna-N	10" AND LARGER NOT AVAILABLE WITH LEVER HANDLE	721321-100	721301-100	10" AND LARGER NOT AVAILABLE WITH LEVER HANDLE	721321G-100	721301G-100	
	EPDM		722321-100	722301-100		722321G-100	722301G-100	
	Viton®		723321-100	723301-100		723321G-100	723301G-100	
12	Buna-N		721321-120	721301-120		721321G-120	721301G-120	
	EPDM		722321-120	722301-120		722321G-120	722301G-120	
	Viton®		723321-120	723301-120		723321G-120	723301G-120	

1: For CPVC valves, add the letter "C" to part numbers listed (e.g., 722311-030**C**).
2: For factory installed Lug Insert Valve with Zinc Plated Lugs, substitute the letter "K" for the the letter "G" (e.g. 721311**K**-030)
3: For True Lug Design Valve with Stainless Steel Lugs, substitute the letter "G" with the letter "L" (e.g. 21311**L**-030).
4: For True Lug Design Valve with Zinc Plated Steel Lugs, substitute the letter "Z" for the letter "G" (e.g. 721311**Z**-030).
Note: Optional BFV with submersible gear operators available, inquire with Spears®.

Temperature Pressure Rating

System Operating Temperature °F (°C)		100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
	CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

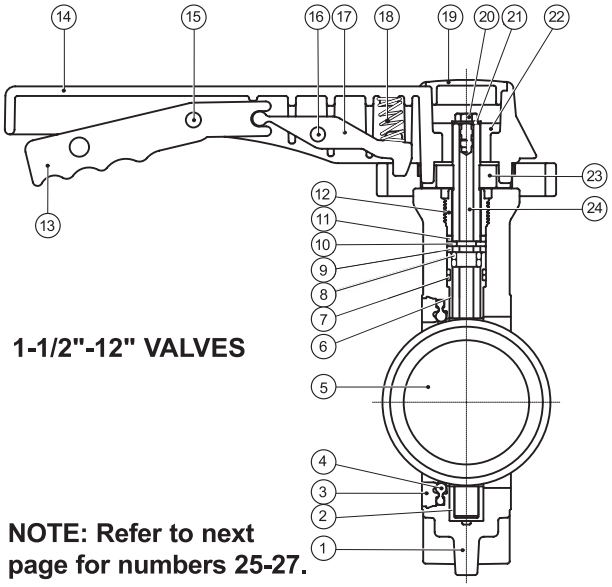
See dimensions and additional Technical Information on following pages

NOT FOR USE WITH COMPRESSED AIR OR GASES

Replacement Parts

No	Component	Qty.	Material
1	Body	1	PVC/CPVC
2	Stem Bearing	1	Teflon® GFPP
3	Seal Carrier	1	PVC/CPVC/PP
4	Seat	1	Buna-N, EPDM, Viton®
5	Disc	1	PVC/CPVC/PP
6	Stem Bushing	1	Teflon® GFPP
7	Bushing O-ring	2	Buna-N, EPDM, Viton®
8	Stem O-ring	2	Buna-N, EPDM, Viton®
9	Stem Washer - Hex	1	Teflon®
10	Stem Washer - Slot*	1-2	SS 316
11	Stem Washer - Round	1	Teflon® GFPP
12	Stem Nut	1	PVC/CPVC
13	Handle Grip	1	GFPVC
14	Handle Body	1	PP
15	Grip Pin	1	PP
16	Lock Pin	1	PP
17	Handle Lock	1	GFPVC
18	Handle Spring	1	SS 316
19	Handle Cover	1	PP
20	Hex Head Cap Screw	1	SS 316
21	Flat Washer	1	SS 316
22	Handle Bushing	1	GFPVC
23	Timing Stop	1	CPVC
24	Stem	1	SS 316
25	Lug Insert	4-12	SS/Zinc Plated Steel
26	Gear Operator Assembly	1	Cast Aluminum
27	Hand Wheel	1	PP
True Lug Only (not shown):			
Seal Carrier Flange Plate		1	PVC/CPVC
Lug & Nut		4-12	SS/Zinc Plated Steel
Plate O-ring		1	Buna-N, EPDM, Viton®

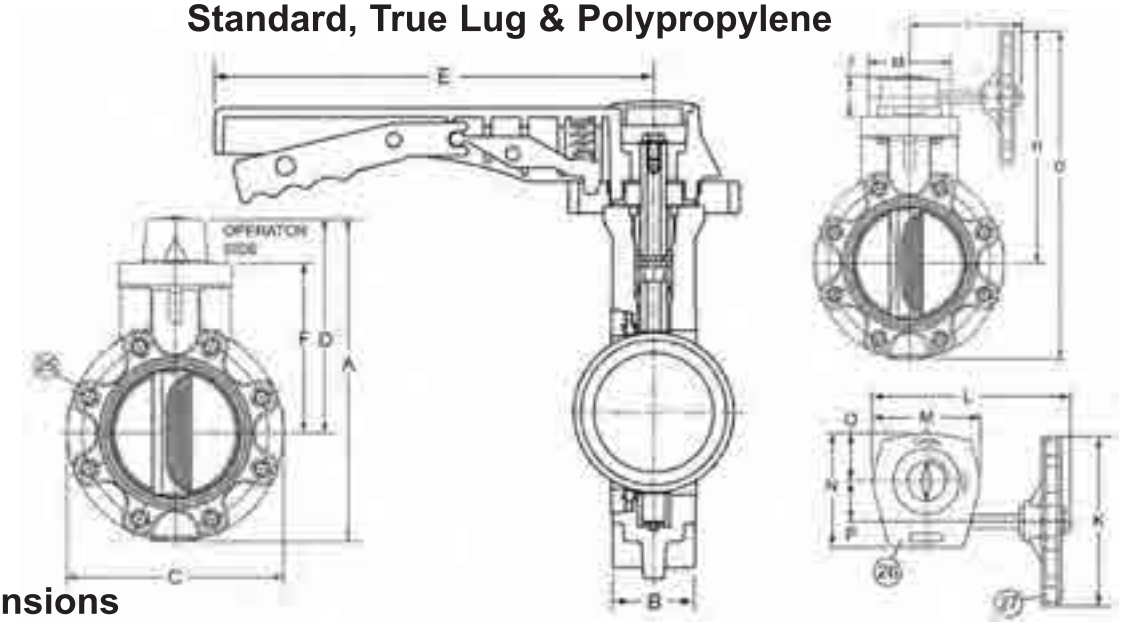
Notes: 1: 2-Slotted washers used on 6" & larger
2: See 14"-24" PP valve illustration for Gear Operator Components, No. 8 - 16



1-1/2"-12" VALVES

NOTE: Refer to next page for numbers 25-27.

Standard, True Lug & Polypropylene



Dimensions

Nominal Size	Pressure Rating[1] (psi)	A	B		C	D	E	F	G
			Standard, Lug Insert	True Lug					
1-1/2	150	8-5/32	1-9/16	2-1/4	5	5-19/32	9-3/32	4-3/32	11-5/32
2	150	9-11/32	1-15/16	2-9/16	6	6-13/32	9	4-3/4	13-1/8
2-1/2	150	10-9/32	2	2-3/4	7	6-25/32	9-1/4	5-1/4	13-1/8
3	150	11-1/2	2-3/32	2-13/16	7-1/2	7-27/32	12	5-5/8	14-5/32
4	150	13	2-9/32	3	9	8-1/2	12	6-1/4	15-5/8
6	150	16-13/32	2-3/4	3-13/32	11-1/16	10-7/8	13-15/16	8-5/8	19-7/32
8	150	18-5/8	2-15/16	3-23/32	13-1/2	12	13-15/16	9-1/2	21-7/16
10	150	N/A	3-1/4	4	16	N/A	N/A	11	26-5/8
12	150	N/A	3-1/2	4-1/2	19	N/A	N/A	12	29-1/8
14	100[2]	N/A	6-1/4	N/A	21	N/A	N/A	13-3/16	29
16	85[2]	N/A	6-3/4	N/A	23-1/2	N/A	N/A	14-7/16	31-1/2
18	70[2]	N/A	7-1/8	N/A	25	N/A	N/A	15-3/16	33
20	50[2]	N/A	7-3/4	N/A	27-1/2	N/A	N/A	16-7/16	35-1/2
24	50[2]	N/A	8-7/16	N/A	32	N/A	N/A	18-11/16	40
30-60	**Contact Spears® for 30" to 60" Valve Dimensions**								

Nominal Size	H	I	J	K	L	M	N	O	P
1-1/2	8-21/32	6-7/16	2-3/8	8	8-13/16	4-13/16	5-3/16	2-13/16	1-27/32
2	10-1/8	6-7/16	2-3/8	8	8-13/16	4-13/16	5-3/16	2-13/16	1-27/32
2-1/2	9-5/8	6-7/16	2-3/8	8	8-13/16	4-13/16	5-3/16	2-13/16	1-27/32
3	10-17/32	6-7/16	2-3/8	8	8-13/16	4-13/16	5-3/16	2-13/16	1-27/32
4	11-1/8	6-7/16	2-3/8	8	8-13/16	4-13/16	5-3/16	2-13/16	1-27/32
6	13-23/32	6-7/16	2-13/32	7-15/16	8-7/8	4-27/32	5-5/32	2-7/32	1-27/32
8	14-11/16	6-7/16	2-13/32	7-15/16	8-7/8	4-27/32	5-3/16	2-7/32	1-27/32
10	18-5/8	7-1/8	2-3/8	8	9-13/16	5-3/8	5-15/16	2-7/16	2-11/32
12	19-5/8	7-1/8	2-3/8	8	9-13/16	5-3/8	5-15/16	2-7/16	2-11/32
14	18-1/2	7-3/8	2-9/16	8	10-13/16	6-7/8	7-7/16	3-1/8	3
16	19-3/4	7-3/8	2-9/16	8	10-13/16	6-7/8	7-7/16	3-1/8	3
18	20-1/2	7-3/8	2-9/16	8	10-13/16	6-7/8	7-7/16	3-1/8	3
20	21-3/4	7-3/8	2-9/16	8	10-13/16	6-7/8	7-7/16	3-1/8	3
24	24	7-3/8	2-9/16	8	10-13/16	6-7/8	7-7/16	3-1/8	3
30-60	**Contact Spears® for 30" to 60" Valve Dimensions**								

1: Maximum Internal Pressure Rating @ 73°F
2: Additional pressure rating is possible with attention to flow direction.

C_V Values & Operating Torque

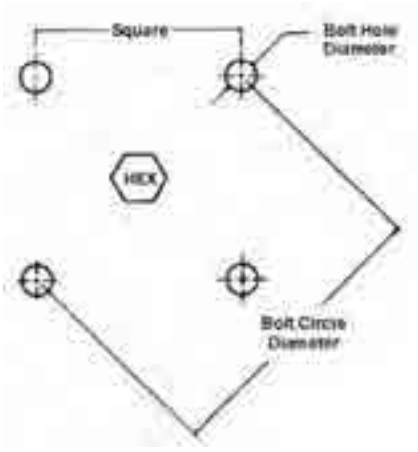
Valve Size	C_V[1] Degrees Open						Operating[2] Torque (in.-lbs.)
	15°	30°	45°	60°	75°	90°	
1-1/2	2	8	20	36	61	81	100
2	3	11	27	49	82	109	11 0
2-1/2	5	19	48	86	144	192	206
3	9	35	86	155	259	345	360
4	10	41	103	185	308	41 1	420
6	28	1 13	281	506	844	1 125	720
8	56	225	562	1012	1687	2249	1200
10	111	444	1 110	1998	3330	4440	1320
12	158	631	1577	2839	4732	6309	1920
14	176	705	1762	3172	5286	7048	See Notes
16	211	846	21 14	3805	6341	8455	
18	273	1092	2730	4914	8190	10920	
20	355	1418	3545	6381	10635	14180	
24	467	1866	4665	8397	13995	18660	

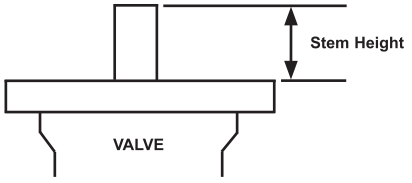
1: Gallons per minute at 1 psi pressure drop.
2: Operating torque for large diameter valves varies significantly with system operating pressure, flow direction and velocity. Contact Spears® for torque requirement based on application.

Actuator Mounting Dimensions

Size	Square	Bolt Hole Diameter	Bolt Circle Diameter	Hex	Stem Height
1-1/2	1.95	.34	2.75	.375 + .000 - .004	.75
2	1.95	.34	2.75	.500 + .000 - .004	.75
2-1/2	1.95	.34	2.75	.500 + .000 - .004	.75
3	2.65	.41	3.75	.563 + .000 - .004	1.00
4	2.65	.41	3.75	.625 + .000 - .004	1.04
6	3.17	.41	4.48	.875 + .000 - .004	1.27
8	3.17	.41	4.48	1.000 + .000 - .004	1.29
10	3.54	.41	5.00	1.125 + .000 - .006	1.38
12	3.54	.41	5.00	1.250 + .000 - .006	1.38
14	3.54	.41	5.00	1.250 + .000 - .006	1.62
16	3.54	.41	5.00	1.250 + .000 - .006	1.75
18	3.54	.41	5.00	1.250 + .000 - .006	1.75
20	3.93	.41	5.56	1.250 + .000 - .006	1.75
24	4.33	.41	6.12	1.250 + .000 - .006	1.75

Actuator Mounting Detail For Custom Actuation





BUTTERFLY VALVE ACCESSORIES

Lug Insert Sets

- Field installable lugs for all Spears® PVC & CPVC Standard Butterfly Valves.
- Allows easy single-side installation to mating flange.
- Choice of high corrosion resistant 316 stainless steel or zinc plated steel construction.

Valve Size	316 Stainless Steel Part Number	Zinc Plated Steel Part Number
1-1/2	LUG1-015	LUG2-015
2 & 2-1/2	LUG1-020	LUG2-020
3	LUG1-030	LUG2-030
4	LUG1-040	LUG2-040
6 & 8	LUG1-080	LUG2-080
10 & 12	LUG1-120	LUG2-120

Lever Handle Kits

- Exact replacement or conversion handle for Spears® 1-1/2" through 8" Butterfly Valves.
- High impact polypropylene construction featuring quick-action reinforced polymer position stop and grip with built-in lock-out capability.
- Includes all components and hardware assembled for quick installation.

Valve Size	Part Number
1-1/2	BFH-015
2 & 2-1/2	BFH-020
3	BFH-030
4	BFH-040
6	BFH-060
8	BFH-080

T-Handle Kits

- Specialty Handle for minimum space requirements.
- High impact polypropylene construction featuring quick-action reinforced polymer position stop and grip with built-in lock-out capability.

Valve Size	Part Number
3	BFTH-030
4	BFTH-040

Speed Handle for Gear Operator

- Quickly attaches to Spears® Gear Operator Handle to allow rapid opening or closing of valve.

Valve Size	Part Number
1-1/2 - 12	SH-120

Positive Stem Stop for Butterfly Valve with Gear Operator

- Provides positive stop for Gear Operator shaft to avoid changes in the degree of opening for varying flow conditions.

Valve Size	Part Number
1-1/2 - 12	PSS-120
14 - 24	PSS-240

BUTTERFLY VALVE ACCESSORIES

2" Square / T-Style Operator Nuts

- Allows operation with conventional 2" Square or T-Style handle wrenches.
- Fits All Spears® Butterfly Valve Gear Operators.

(NOT FOR USE ON VALVE STEM)

Valve Size	Part Number
1-1/2 - 24	GTN-040

Gear Operator Kits

- Bolt-on conversion or replacement unit for all Spears® Butterfly Valves.
- Cast aluminum construction with high efficiency worm gear drive, built-in position indicator and easy-grip polypropylene handwheel.
- Includes all components and hardware for direct mount to valve.

Gear Operator Kits

Valve Size	1-1/2	2	2-1/2	3	4	6	8	10	12
Part Number	GO-015	GO-020	GO-025	GO-030	GO-040	GO-060	GO-080	GO-100	GO-120

Powder Coated Gear Operator Kits

Valve Size	1-1/2	2	2-1/2	3	4	6	8	10	12
Part Number	GOP-015	GOP-020	GOP-025	GOP-030	GOP-040	GOP-060	GOP-080	GOP-100	GOP-120

Extended Chemical Resistance Options

Spears® offers several options for extended chemical resistance in PVC, CPVC and Polypropylene Butterfly Valves, including those listed below. Contact Spears® for additional ordering information.

PTFE Seat Sleeves

- PTFE envelope-type sleeve encases and isolates Spears® standard elastomer seat for extended chemical resistance while maintaining resiliency and sealing capability.
- Available for valve sizes 1-1/2" - 12"
- Sold factory-installed in PVC, CPVC or PP valves.

Teflon® Coated Valve Stems

- Durable, bonded Teflon® coating over standard SS 316L stem for extended chemical resistance.
- Viable alternative to more costly special alloy stems.
- Available for all valve sizes.
- Sold factory installed in PVC, CPVC or PP valves.

Sample Engineering Specification

All thermoplastic Diaphragm valves shall be Weir-type constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D1784 Cell Classification 23447, or Polypropylene, ASTM D 4101. All diaphragms shall be EPDM, Viton® or PTFE with EPDM or Viton® bonded backing. All valves shall have built-in position indicator with polypropylene handwheel. All True Union style valve union nuts shall have Buttress threads. All PVC and CPVC 1/2" through 2" valves shall be pressure rated to 235 psi, all 2-1/2" through 4" and all flanged valves shall be pressure rated to 150 psi, all 6" valves shall be pressure rated to 100 psi, and all 8" valves shall be pressure rated to 75 psi for water at 73°F. All Polypropylene valves shall be pressure rated to 150 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.

Features … PVC, CPVC & PP

This full-featured valve is engineered to provide accurate throttling control and shutoff for industrial, chemical and water treatment applications. Weir-type design eliminates entrapped fluids in valve and is excellent for handling liquids with suspended solids, viscous fluids and slurries. Available in PVC, CPVC
with a variety of Diaphragm material options. PVC & CPVC 1/2" - 2" valves with Flanged Body, Spigot Body or True Union style Socket & Threaded ends or Optional Special Reinforced (SR) Threads, and sizes 2-1/2" - 8" with Flanged Body. Polypropylene 1/2" - 2" valves with True Union style Special Reinforced (SR) Threaded ends and sizes 2-1/2" - 8" with Flanged Body. True Union style also available in metric socket and BSP thread sizes 1/2" through 2".

- True Union Style with Buttress Thread Union Nuts - Mate with Spears® True Union 2000 Ball valves and Union 2000 Pipe Unions.
- EPDM, Viton®, or Elastomer (EPDM or Viton®) Bonded PTFE Diaphragms.
- PVC & CPVC Sizes 1/2" - 2" Pressure Rated to 235 psi @ 73°F, Sizes 2-1/2" - 4" and all flanged Pressure Rated to 150 psi @ 73°F, 6" Pressure Rated to 100 psi and 8" to 75 psi @ 73°F
- Polypropylene Sizes 1/2" - 4" Pressure rated to 150 psi @ 73°F
- Easy-Grip, High Impact Polypropylene Handwheel
- Built-in, Clear-View Position Indicator
- Stainless Steel External Hardware
- Fully Serviceable, Replaceable Components
- Suitable for Vacuum Service
- Assembled with Silicone-Free Lubricants (no lubricant in media contact area)

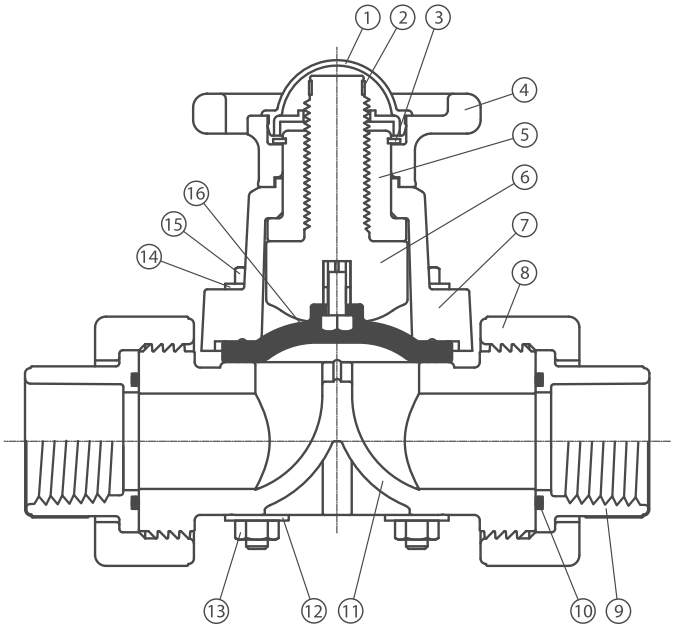
PVC & CPVC Diaphragm Valve Quick-View Selection Chart

Valve Size	O-ring Material	Diaphragm Material	PVC Part Number[1]			Pressure Rating
			Socket/Thread	Spigot	Flanged	
1/2	EPDM	EPDM	2729-005	2727-005	2723-005	True Union & Spigot Style w/ Elastomer Diaphragms 235 psi Non-Shock Water @ 73°F
		PTFE[2]	2729T-005	2727T-005	2793T-005	
	Viton®	Viton®	2739-005	2737-005	2733-005	
		PTFE[2]	2739T-005	2737T-005	2793T-005	
3/4	EPDM	EPDM	2729-007	2727-007	2723-007	
		PTFE[2]	2729T-007	2727T-007	2723T-007	
	Viton®	Viton®	2739-007	2737-007	2733-007	
		PTFE[2]	2739T-007	2737T-007	2793T-007	
1	EPDM	EPDM	2729-010	2727-010	2723-010	
		PTFE[2]	2729T-010	2727T-010	2793T-010	
	Viton®	Viton®	2739-010	2737-010	2733-010	
		PTFE[2]	2739T-010	2737T-010	2793T-010	
1-1/4	EPDM	EPDM	2729-012	2727-012	2723-012	
		PTFE[2]	2729T-012	2727T-012	2793T-012	
	Viton®	Viton®	2739-012	2737-012	2733-012	
		PTFE[2]	2739T-012	2737T-012	2793T-012	
1-1/2	EPDM	EPDM	2729-015	2727-015	2723-015	
		PTFE[2]	2729T-015	2727T-015	2793T-015	
	Viton®	Viton®	2739-015	2737-015	2733-015	
		PTFE[2]	2739T-015	2737T-015	2793T-015	
2	EPDM	EPDM	2729-020	2727-020	2723-020	Flanged Style & Valves w/ PTFE Diaphragms 150 psi Non-Shock Water @ 73°F
		PTFE[2]	2729T-020	2727T-020	2723T-020	
	Viton®	Viton®	2739-020	2737-020	2733-020	
		PTFE[2]	2739T-020	2737T-020	2793T-020	
2-1/2	EPDM	EPDM			2723-025	
		PTFE[2]			2793T-025	
	Viton®	Viton®			2733-025	
		PTFE[2]			2793T-025	
3	EPDM	EPDM			2723-030	
		PTFE[2]			2793T-030	
	Viton®	Viton®			2733-030	
		PTFE[2]			2793T-030	
4	EPDM	EPDM			2723-040	
		PTFE[2]			2793T-040	
	Viton®	Viton®			2733-040	
		PTFE[2]			2793T-040	
6	EPDM	EPDM			2723-060	100 psi Non-Shock Water @ 73°F
		PTFE[2]			2793T-060	
	Viton®	Viton®			2733-060	
		PTFE[2]			2793T-060	
8	EPDM	EPDM			2723-080	75 psi Non-Shock Water @ 73°F
		PTFE[2]			2793T-080	
	Viton®	Viton®			2733-080	
		PTFE[2]			2793T-080	

1: For CPVC valves, add the letter □CŽ to part numbers listed (e.g., 2729-006). Custom end connections available upon request.

2: Elastomer-backed PTFE (standard EPDM backed; special order Viton® backed)

DIAPHRAGM VALVES



Replacement Parts

No.	Component	Qty.	Material
1	Indicator Cover	1	PVC Clear
2	Indicator	1	PE
3	Retaining Ring	1	SS
4	Handwheel	1	PP
5	Compressor	1	Teflon® CPVC
6	Compressor	1	CPVC
7	Bonnet	1	GFPP
8	Union Nut	1	PVC/CPVC/GFPP
9	Union End	2	PVC/CPVC/GFPP
10	Union End O-ring	2	EPDM/Viton®
11	Body	1	PVC/CPVC/GFPP
12	Lock Washer	4-16	SS
13	Nut	4-16	SS
14	Flat Washer	4-16	SS
15	Bolt	4-16	SS
16	Diaphragm	1	EPDM/Viton®/PTFE

1: Component applicable to True Union style valves only.
2: True Union Socket/Threaded Valve illustrated

Temperature Pressure Rating

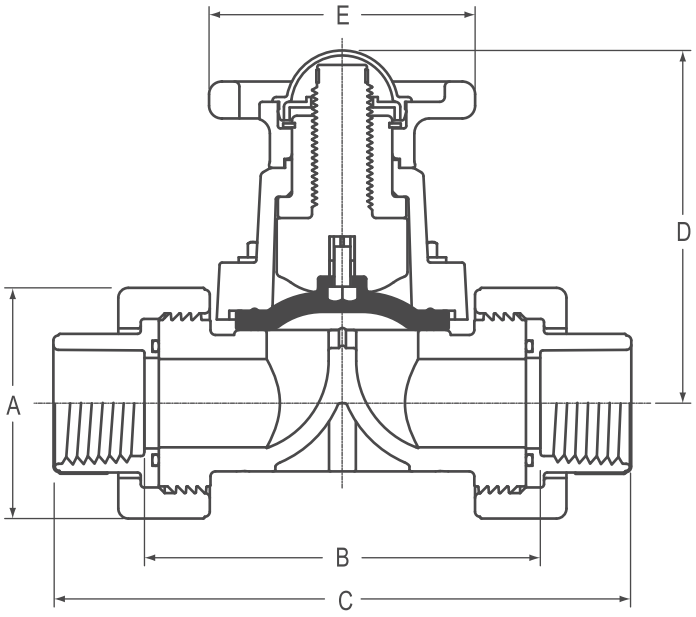
System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0-	-0-	-0-	-0-	-0-	-0-	-0-
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0-
	2-1/2" - 4"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0-	-0-	-0-	-0-	-0-	-0-	-0-
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0-
	6"	PVC	100 (.70)	90 (.62)	80 (.55)	65 (.38)	50 (.34)	-0-	-0-	-0-	-0-	-0-	-0-	-0-
		CPVC	100 (.70)	95 (.66)	90 (.62)	85 (.59)	80 (.55)	75 (.52)	70 (.48)	65 (.45)	60 (.41)	55 (.38)	50 (.34)	-0-
	8"	PVC	75 (.52)	70 (.48)	65 (.45)	60 (.41)	50 (.34)	-0-	-0-	-0-	-0-	-0-	-0-	-0-
		CPVC	75 (.52)	72 (.49)	70 (.48)	67 (.46)	65 (.45)	62 (.43)	60 (.41)	55 (.38)	50 (.34)	45 (.31)	40	-0-

NOT FOR USE WITH COMPRESSED AIR OR GASES

C_V Values PVC, CPVC & PP

Valve Size	PERCENT OPEN			
	100%	75%	50%	25%
1/2	5.1	4.8	4.2	2.4
3/4	8.0	7.5	6.5	3.8
1	11.5	10.8	9.4	5.4
1-1/4	22.0	20.6	18.0	10.3
1-1/2	28.2	26.4	23.0	13.3
2	52.9	49.6	43.2	24.9
2-1/2	119.0	111.5	97.1	55.9
3	119.0	111.5	97.1	55.9
4	189.2	177.3	154.4	88.9
6	402.2	375.8	327.0	187.5
8	700.0	659.5	573.2	328.4

Gallons per minute at 1 psi pressure drop.

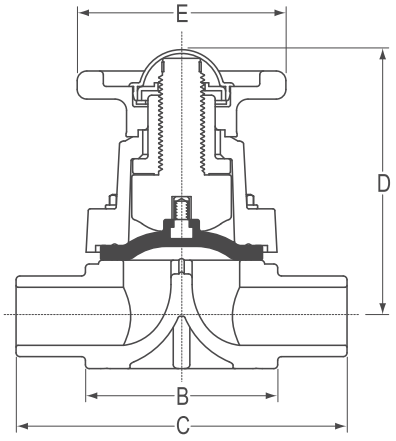


Socket, Threaded & End Connectors Dimensions & Weights

Nominal Size	Dimension Reference (inches, ± 1/16)						Approx. Wt. (Lbs.)	
	A	B[1]	C		D	E	PVC	CPVC
			Socket	Threaded				
1/2	1-15/16	3-7/8	5-9/16	5-3/16	3-11/32	2-7/8	1.12	1.14
3/4	2-1/2	4-1/2	6-7/16	5-15/16	3-3/4	3-1/8	1.37	1.36
1	2-9/16	4-15/16	7-3/16	6-13/16	4-7/16	3-3/8	2.35	2.43
1-1/4	3-5/16	5-1/2	8-7/8	8-1/4	5-5/8	3-7/8	3.91	4.03
1-1/2	3-17/32	6-5/16	9-5/16	8-7/16	5-5/8	4-5/8	4.08	4.21
2	4-7/32	7-1/2	10-9/16	9-1/2	7	6-5/8	7.06	7.25

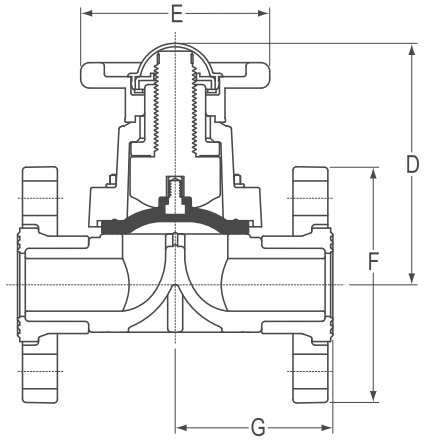
1: Valve Lay Length.

NOT FOR USE WITH COMPRESSED AIR OR GASES



Spigot Diaphragm Dimensions & Weights

Nominal Size	Dimension Reference (inches, ± 1/16)				Approx. Wt. (Lbs.)	
	B	C	D	E	PVC	CPVC
1/2	2-5/8	4-3/8	3-11/32	2-7/8	.61	.63
3/4	2-3/4	4-3/4	3-3/4	3-1/4	.79	.82
1	3-1/8	5-3/8	4-7/16	3-5/16	1.32	1.36
1-1/4	3-3/4	6-1/4	5-5/8	4-19/32	2.41	2.50
1-1/2	3-3/4	6-1/2	5-5/8	4-9/32	2.43	2.52
2	4-3/4	7-3/4	7	5-7/8	4.15	4.43



Flanged Diaphragm Dimensions & Weights

Nominal Size	Dimension Reference (inches, ± 1/16)				Approx. Wt. (Lbs.)	
	D	E	F	G	PVC	CPVC
1/2	3-11/32	2-7/8	3-1/2	2-5/16	.98	1.02
3/4	3-3/4	3-1/4	3-7/8	2-1/2	1.31	1.37
1	4-7/16	3-5/16	4-1/4	2-13/16	2.00	2.08
1-1/4	5-5/8	4-19/32	4-5/8	3-1/4	3.71	3.76
1-1/2	5-5/8	4-19/32	5	3-3/8	3.88	4.04
2	7	5-7/8	6	4	5.59	5.71
2-1/2	10-1/4	8-7/8	7-1/2	5-19/32	15.75	16.43
3	10-1/4	8-7/8	7-1/2	5-19/32	15.75	16.45
4	12-1/4	10-1/2	9	6-5/8	24.44	25.37
6	16-3/4	18-13/32	11	9-3/8	53.90	58.43
8	21	21-19/32	13-1/2	11-5/32	96.28	100.05

Sample Engineering Specification

All sediment strainers shall be Y-type constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D1784 Cell Classification 23447. All O-rings shall be EPDM or Viton®. All Y-strainers shall have replaceable PVC, CPVC or Type 316 stainless steel screens and O-ring sealed drain plugs with magnetic drain plug option. All threaded Y-Strainers shall have Special Reinforced (SR) threads. All Y-Strainers, sizes 1/2"- 2" shall be pressure rated to 150 psi, sizes 3"- 4" to 90 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.

Features - PVC Gray, PVC Clear & CPVC

Spears® Y-type sediment strainers are the perfect choice for in-line removal of suspended solids, sediment, dirt and debris. Convenient removable strainer basket allows quick cleaning with an assortment of screen mesh sizes to meet a variety of application needs. Spears® Y-Strainers are produced from PVC Gray, PVC Clear for fluid visibility and CPVC Gray for higher temperatures. Available with socket, Special Reinforced (SR) threads, flanged, or True Union socket and SR threaded end connectors in IPS sizes 1/2" - 4".

- ☐ Provides In-line Protection of Process Equipment
- ☐ PVC, CPVC or PVC Clear Construction
- ☐ EPDM or Viton® O-ring Seals
- ☐ Removable Strainer Basket with O-ring Sealed Drain Plug Allows Quick-Flushing or Bleed-Off Valve Connection
- ☐ Multiple Strainer Screen Options in PVC, CPVC, and Type 316 Stainless Steel (see Mesh Code table)
- ☐ Optional Magnetic Drain Plug for Ferrous Metal Pickup
- ☐ Suitable for Horizontal or Vertical Installation
- ☐ Sizes 1/2"- 2" Pressure Rated to 150 psi @ 73°F Sizes 3"- 4" to 90 psi @ 73°F
- ☐ Assemble with Silicone-Free, Water Soluble Lubricants

Quick-View Y-Strainer Selection Chart

Valve Size	O-ring Material	PVC Material[1,2,3]					Pressure Rating
		Socket	SR Threaded	Flanged	Socket Union	SR Threaded Union	
1/2	EPDM	YS22P__-005	YS21P__-005SR	YS23P__-005	YS2AP__-005	YS2BP__-005	150 psi Non-Shock Water @73°F
	Viton®	YS32P__-005	YS31P__-005SR	YS33P__-005	YS3AP__-005	YS3BP__-005	
3/4	EPDM	YS22P__-007	YS21P__-007SR	YS23P__-007	YS2AP__-007	YS2BP__-007	
	Viton®	YS32P__-007	YS31P__-007SR	YS33P__-007	YS3AP__-007	YS3BP__-007	
1	EPDM	YS22P__-010	YS21P__-010SR	YS23P__-010	YS2AP__-010	YS2BP__-010	
	Viton®	YS32P__-010	YS31P__-010SR	YS33P__-010	YS3AP__-010	YS3BP__-010	
1-1/4	EPDM	YS22P__-012	YS21P__-012SR	YS23P__-012	YS2AP__-012	YS2BP__-012	
	Viton®	YS32P__-012	YS31P__-012SR	YS33P__-012	YS3AP__-012	YS3BP__-012	
1-1/2	EPDM	YS22P__-015	YS21P__-015SR	YS23P__-015	YS2AP__-015	YS2BP__-015	
	Viton®	YS32P__-015	YS31P__-015SR	YS33P__-015	YS3AP__-015	YS3BP__-015	
2	EPDM	YS22P__-020	YS21P__-020SR	YS23P__-020	YS2AP__-020	YS2BP__-020	
	Viton®	YS32P__-020	YS31P__-020SR	YS33P__-020	YS3AP__-020	YS3BP__-020	
3	EPDM	YS22P__-030	YS21P__-030SR	YS23P__-030	YS2AP__-030	YS2BP__-030	90 psi Non-Shock Water @73°F
	Viton®	YS32P__-030	YS31P__-030SR	YS33P__-030	YS3AP__-030	YS3BP__-030	
4	EPDM	YS22P__-040	YS21P__-040SR	YS23P__-040	YS2AP__-040	YS2BP__-040	
	Viton®	YS32P__-040	YS31P__-040SR	YS33P__-040	YS3AP__-040	YS3BP__-040	

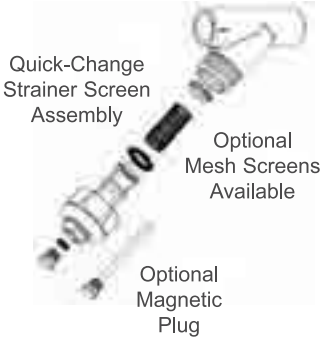
Enter Mesh Code in part number blank as speci ed in table.
(Contact Spears® for additional strainer sizes).

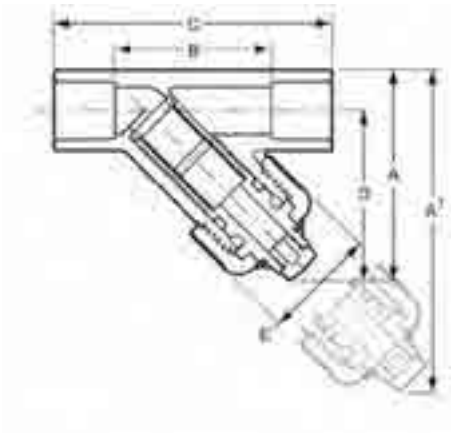
1: For CPVC body & strainer screen unit, replace the letter □PŽ before the dash separator with the letter □CŽ and add the letter □CŽ to the part number (e.g.YS22C8-020**C**)
2: For stainless steel strainer screens, replace the letter □PŽ (or □CŽ) before the dash separator with the letter □SŽ (e.g.YS22S8-020; YS22S8-020**C**)
3: For PVC Clear Y-Strainer, add the letters □CLŽ to the part number (e.g.YS22P8-005**CL**)
Note: End connections for PVC Clear threaded and anged Y-strainers are PVC Gray components.

Mesh Codes for PVC, CPVC & SS

Mesh	Sieve Opening Size (in.)	Mesh Code
8 Mesh	0.094	8
12 Mesh	0.062	12
20 Mesh	0.033	20
30 Mesh	0.024	30

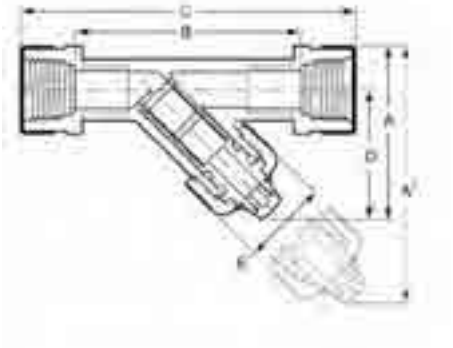
Additional Stainless Steel screens available to 320 mesh, custom ordered.





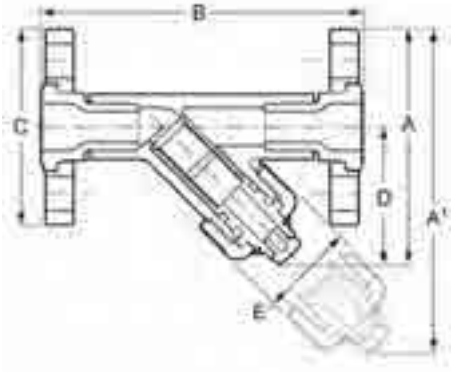
Socket Y-Strainer Dimensions & Weights

Nominal Size	Dimension Reference (inches, ± 1/16)						Approx. Wt. (Lbs.)	
	A[1]	A	B	C	D	E	Socket	
							PVC	CPVC
1/2	5	3-1/16	1-9/16	3-3/8	2-9/16	1-5/8	.31	.33
3/4	5-3/4	3-11/16	2	4	3	2	.50	.53
1	6-7/8	4-7/16	2-1/2	4-3/4	3-5/8	2-1/4	.85	.90
1-1/4	8-5/32	5-5/16	3-1/16	5-9/16	4-1/4	2-13/16	1.21	1.28
1-1/2	9-1/8	6	3-9/16	6-5/16	4-7/8	3-3/16	1.66	1.76
2	11-3/4	7-5/8	4-1/2	7-1/2	6-3/16	3-1/2	2.96	3.10
3	15	9-11/16	6-9/16	10-5/16	7-5/8	5-1/8	5.34	5.64
4	19-11/16	12-1/2	8-5/8	13-1/8	9-7/8	6-9/16	9.97	10.45



SR Threaded Y-Strainer Dimensions & Weights

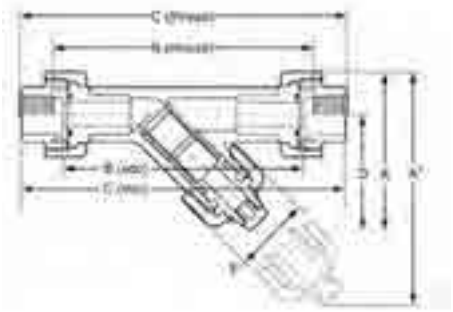
Nominal Size	Dimension Reference (inches, ± 1/16)						Approx. Wt. (Lbs.)	
	A[1]	A	B	C	D	E	SR Threaded	
							PVC	CPVC
1/2	6-1/2	4-11/16	3-5/8	5-1/16	4	2-3/8	.31	.33
3/4	7-5/8	5-7/16	4-3/8	5-13/16	4-9/16	2-3/8	.50	.53
1	8-5/8	6-1/8	5-3/16	7	5-1/8	2-3/8	.85	.90
1-1/4	11-1/8	7-3/4	6	7-15/16	6-1/2	3-1/2	1.21	1.28
1-1/2	12-1/4	8-7/8	6-15/16	8-13/16	7-1/2	3-1/2	1.66	1.76
2	14-1/16	10-3/16	8-1/8	10-1/8	8-1/2	3-1/2	2.96	3.10
3	20	14-13/16	11	14-1/4	12-7/16	6-5/8	5.34	5.64
4	25-13/16	18-1/2	14	14-3/4	15-5/8	7-15/16	9.97	10.45



Flanged Y-Strainer Dimensions & Weights

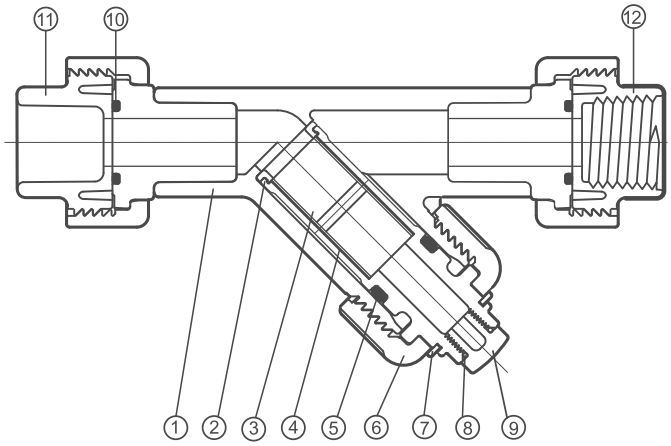
Nominal Size	Dimension Reference (inches, ± 1/16)						Approx. Wt. (Lbs.)	
	A[1]	A	B	C	D	E	Flanged	
							PVC	CPVC
1/2	5-13/16	4-3/16	5-11/16	3-1/2	2-1/2	1-5/8	.82	.85
3/4	7-1/8	5	6-7/16	3-7/8	3-1/8	2	1.23	1.28
1	8-3/16	5-3/4	7-1/4	4-1/4	3-5/8	2-1/4	1.70	1.81
1-1/4	9-7/16	6-9/16	8-1/8	4-5/8	4-9/32	2-13/16	2.40	2.52
1-1/2	10-7/16	7-3/8	9-3/16	5	4-7/8	3-3/16	3.07	3.25
2	13-1/4	9-1/8	10-3/8	6	6-3/16	3-1/2	5.20	5.42
3	16-21/32	11-3/8	12-1/32	7-1/2	7-5/8	5-1/8	9.44	10.07
4	21-19/32	14-5/16	14-9/16	9-1/16	9-7/8	6-9/16	14.87	16.15

Note: 4" flanged Y-strainer uses split flange ring



True Union Y-Strainer Dimensions & Weights

Nominal Size	Dimension Reference (inches, ± 1/16)								Approx. Wt. (Lbs.)	
	A[1]	A	B		C		D	E	Union	
			Socket	SR Thread	Socket	SR Thread			PVC	CPVC
1/2	5	3-7/16	5-1/8	5-1/2	6-7/8	7	2-1/2	1-5/8	.49	.53
3/4	6-3/16	4-1/8	5-7/8	6-7/16	7-7/8	7-7/8	3	2	.80	.85
1	7-5/16	4-7/8	6-1/2	7-3/8	8-3/4	9	3-5/8	2-1/4	1.13	1.20
1-1/4	8-5/8	5-13/16	7-7/16	6-3/16	9-15/16	10-1/8	4-1/4	2-13/16	1.84	1.90
1-1/2	9-3/4	6-5/8	8-3/16	9	10-15/16	10-15/16	4-7/8	3-3/16	2.44	2.52
2	12-7/16	8-15/16	9-7/16	10-13/16	12-7/16	12-13/16	6-3/16	3-1/2	4.33	4.45
3	16-1/6	10-3/4	12-3/16	13-15/16	16	16-3/4	7-5/8	5-1/8	10.35	10.55
4	20-15/16	13-3/4	15-5/16	17-1/2	19-13/16	20-1/2	9-7/8	6-9/16	18.51	18.80



Replacement Parts

NO.	COMPONENT	OTY.	MATERIAL
1	Body[1] (SOC/SR/FLANGE/UNION)	1	PVC/PVC CLEAR/CPVC
2	Screen Support Ring	1	PVC/CPVC
3	Screen	1	PVC/CPVC/SS 316
4	Screen Support Housing	1	PVC/CPVC
5	Housing O-ring	1	EPDM/VITON®
6	Bonnet Nut	1	PVC/CPVC
7	Retaining Clip	1	PP
8	Plug O-ring	1	EPDM/VITON®
9	Plug	1	PVC/CPVC
10	Union O-ring	2	EPDM/VITON®
11	Union Socket End	2	PVC/CPVC
12	Union SR Threaded End	2	PVC/CPVC

1 - Body Includes: Body (1), Spigot Adapters (2), SS Collars (2)
- Flange Body Includes: Body (1), Spigot Hubs (2), Flange Rings (2)
- Union Body Includes: Body (1), Spigot Ends (2), Nuts (2)

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Strainer Pressure Rating psi (MPa)	1/2" - 2"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0-	-0-	-0-	-0-	-0-	-0-	-0-
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0-
	3" - 4"	PVC	90 (.70)	85 (.62)	75 (.52)	60 (.41)	40 (.30)	-0-	-0-	-0-	-0-	-0-	-0-	-0-
		CPVC	90 (.70)	85 (.62)	80 (.55)	75 (.52)	70 (.48)	60 (.41)	50 (.34)	45 (.31)	40 (.30)	35 (.24)	30 (.21)	-0-

Drain Plug Tap Size

Y-Strainer Size	Tap Size (NPT)
1/2	1/4 - 18
3/4	1/4 - 18
1	3/8 - 18
1-1/4	1/2 - 14
1-1/2	1 - 11 - 1/2
2	1 - 11 - 1/2
3	1 - 11 - 1/2
4	1 - 11 - 1/2

Y-Strainer C_V

Nominal Size	Plastic Strainer Mesh			
	8	12	20	30
1/2	5.5	5.4	5.3	5.2
3/4	8.2	7.8	7.5	7.2
1	14.3	13.9	13.6	13.3
1-1/4	33.6	32.9	29.4	25.4
1-1/2	43.8	41.6	33.0	32.1
2	50.6	50.0	49.6	48.8
3	75.2	74.6	74.0	73.4
4	169.5	169.0	168.8	168.0

Gallons per minute at 1 psi pressure drop.
Plastic Strainers are perforated PVC or CPVC screens.
Standard is mesh.

BASKET STRAINERS

Sample Engineering Specification

All thermoplastic Basket Strainers shall be fabricated from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447 material. All O-rings shall be EPDM or Viton®. Strainer baskets shall be perforated PVC, CPVC, or type 316 stainless steel, or type 316 stainless steel wire mesh. Standard strainer perforations shall be 1/8" or 3/32" with a minimum open area ratio of 6:1, or specified perforation/mesh opening. Basket strainer sizes 1/2" - 8" shall have quick release clamp retained bonnet, sizes 10" - 12" shall have bolt-on bonnet. All basket Strainers shall have pressure release valve and safety pressure gauge. Unit shall be equipped with O-ring sealed drain plug at lower end. Basket strainer sizes 1/2" - 8" shall be pressure rated at 150 psi, sizes 10" - 12" to 50 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.

Quick-View Basket Strainer Selection Chart

Valve Size	O-ring Material	PVC Part Numbers[1,2]			Pressure Rating
		Socket	Spigot	Flanged	
1/2	EPDM	BS22P__-005	BS27P__-005	BS23P__-005	150 psi Non-Shock Water @ 73°F
	Viton®	BS32P__-005	BS37P__-005	BS33P__-005	
3/4	EPDM	BS22P__-007	BS27P__-007	BS23P__-007	
	Viton®	BS32P__-007	BS37P__-007	BS33P__-007	
1	EPDM	BS22P__-010	BS27P__-010	BS23P__-010	
	Viton®	BS32P__-010	BS37P__-010	BS33P__-010	
1-1/4	EPDM	BS22P__-012	BS27P__-012	BS23P__-012	
	Viton®	BS32P__-012	BS37P__-012	BS33P__-012	
1-1/2	EPDM	BS22P__-015	BS27P__-015	BS23P__-015	
	Viton®	BS32P__-015	BS37P__-015	BS33P__-015	
2	EPDM	BS22P__-020	BS27P__-020	BS23P__-020	
	Viton®	BS32P__-020	BS37P__-020	BS33P__-020	
2-1/2	EPDM	BS22P__-025	BS27P__-025	BS23P__-025	
	Viton®	BS32P__-025	BS37P__-025	BS33P__-025	
3	EPDM	BS22P__-030	BS27P__-030	BS23P__-030	
	Viton®	BS32P__-030	BS37P__-030	BS33P__-030	
4	EPDM	BS22P__-040	BS27P__-040	BS23P__-040	
	Viton®	BS32P__-040	BS37P__-040	BS33P__-040	
6	EPDM	BS22P__-060	BS27P__-060	BS23P__-060	
	Viton®	BS32P__-060	BS37P__-060	BS33P__-060	
8	EPDM	BS22P__-080	BS27P__-080	BS23P__-080	
	Viton®	BS32P__-080	BS37P__-080	BS33P__-080	
10	EPDM	BS22P__-100	BS27P__-100	BS23P__-100	50 psi Non-Shock Water @ 73°F
	Viton®	BS32P__-100	BS37P__-100	BS33P__-100	
12	EPDM	BS22P__-120	BS27P__-120	BS23P__-120	
	Viton®	BS32P__-120	BS37P__-120	BS33P__-120	

Enter Mesh Code in part number blank as specified in table.

(Contact Spears® for additional strainer sizes).

1: For CPVC body & strainer screen unit, replace the letter "P" before the dash separator with the letter "C" and add the letter "C" to the part number (e.g., BS22C8-020**C**)

2: For stainless steel strainer screens, replace the letter "P" (or "C") before the dash separator with the letter "S" (e.g., BS22S8-020; BS22S8-020**C**)

Features … PVC, CPVC

Spears® fabricated Basket Strainers are constructed of heavy bodied PVC or CPVC. Available in IPS sizes 1/2" through 12" with choice of socket, spigot or flanged ends and EPDM, Viton® or PTFE encapsulated O-ring seals. A convenient quick release clamp cap is equipped with safety pressure gauge and pressure release ball valve for safer system operation and strainer cleaning. Additional drain plug allows complete drain and flush of unit. Designed to remove unwanted solids from plastic or metal piping systems, Spears® Basket Strainers are ideal for protecting valves, filters, pumps, nozzles or other liquid control devices in corrosive or non-corrosive fluid systems.

- ☐ Chemical & Corrosion Resistant PVC or CPVC Construction
- ☐ Convenient Quick-Release Clamp For easy Bonnet Removal (Bolt-on Bonnet on Sizes 10" & 12")
- ☐ Includes Pressure Release Valve and 0-160 psi Safety Pressure Gauge[1] (O-ring sealed plugs provided if valve/gauge not used)
- ☐ O-ring Sealed Drain Plug
- ☐ EPDM or Viton® O-ring Seals
- ☐ Perforated PVC & CPVC Strainer Baskets in a Variety of Sizes. Stainless Steel Available in perforation and Multiple Mesh Sizes
- ☐ High Volume 6:1 Open Area Ratio
- ☐ Sizes 1/2" - 8" Pressure Rated to 150 psi @ 73°F Sizes 10" - 12" Pressure Rated to 50 psi @ 73°F
- ☐ Assembled with Silicone-Free Seal Lubricants.

1: Commercial bronze bourdon-tube type pressure gauge w/brass NPT inlet. Check for any chemical compatibility issues. Contact Spears® for PVC, CPVC or PP Gauge Guard isolation devices available.

Special Options

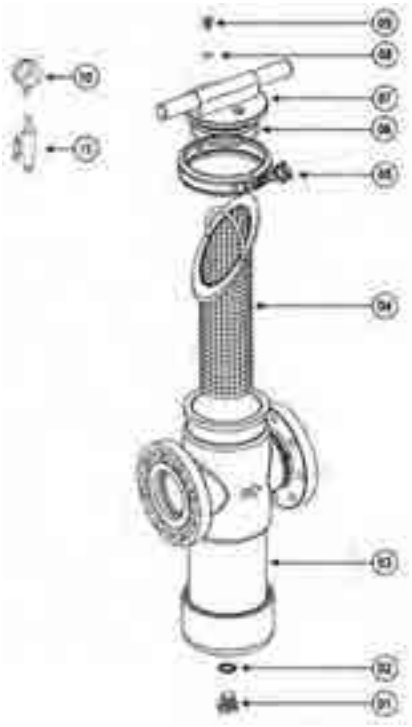
☐Teflon® Encapsulated O-ring Seals
☐Bonnet Sight Glass

Perforation Mesh Codes

Perforation Size (in.)	Mesh Code
1/16	12
3/32	8
1/8	6
3/16	4
1/4	3
3/8	2

Example: BS22P**6**-020
Additional perforation and mesh sizes available upon request.

BASKET STRAINERS

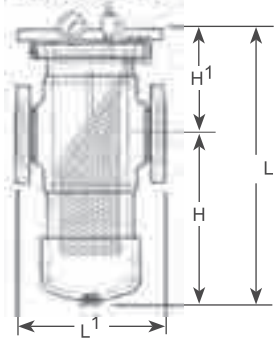


Replacement Parts

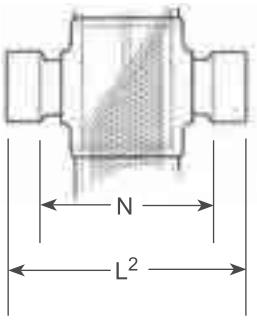
No.	Component	Quantity	Material
1	Drain Plug	1	PVC/CPVC
2	Drain Plug O-ring	1	EPDM/Viton®/PTFE
3	Body	1	PVC/CPVC
4	Strainer Basket	1	PVC/CPVC /316 Stainless Steel
5	Bonnet Clamp	1	SS 316
6	Bonnet O-ring	1	EPDM/Viton®/PTFE
7	Bonnet	1	PVC/CPVC
8	Plug O-ring	2	EPDM/Viton®/PTFE
9	Gauge Port Plug	2	PVC/CPVC
10	Pressure Gauge	1	0-160 psi
11	Pressure Relief Valve	1	PVC/CPVC

Notes: 1) Bolt-on Bonnet on Sizes 10" & 12".
2) Port plugs for use when pressure gauge and relief valve are not installed.
3) Valve O-rings correspond to Strainer Basket Specification.

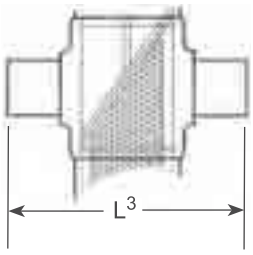
Flanged Style



Socket Style



Spigot Style



Dimensions, Weights & Cv Values

Size	H	H1	L	L1	L2	L3	N	Approx. Wt. (Lbs.)		Cv
								Socket/ Spigot	Flanged	
1/2	5-5/16	4-1/4	9-9/16	9-1/4	6-13/16	8-13/16	5	2.97	3.35	4.5
3/4	5-5/16	4-1/4	9-9/16	9-15/16	6-13/16	9-5/16	4-13/16	2.99	3.44	10
1	5-5/16	4-1/4	9-9/16	10-7/16	6-1/2	9-1/2	4-3/8	3.02	3.50	15
1-1/4	10-1/4	7-7/8	18-1/8	8-9/16	10-1/16	10-1/4	7-9/16	3.20	3.60	30
1-1/2	10-1/4	7-7/8	18-1/8	8-3/4	11-1/8	11	8-1/8	3.50	3.75	46
2	10-1/4	7-7/8	18-1/8	8-3/4	12-1/8	11	8-5/8	11.00	11.40	72
2-1/2	10-1/4	7-7/8	18-1/8	8-3/4	12-3/8	12-7/8	8-3/8	12.30	12.60	110
3	13-13/16	8-13/16	22-5/8	11-5/8	16-1/8	15	11-5/8	25.00	25.40	172
4	17-1/2	8-13/16	26-5/16	12	18	17-1/2	13-1/2	25.70	26.80	270
6	18-7/8	10-9/16	29-7/16	17-1/8	24-3/8	23-5/16	17-7/8	58.40	60.80	630
8	24-1/2	11-9/16	36-1/16	20-1/2	30-1/2	27-1/2	22	93.60	96.00	750
10	27-1/8	16-5/8	43-3/4	26	34-9/16	34-1/2	24-1/16	200.20	210.30	893
12	34-7/8	17-3/16	52-1/16	28-1/8	38-3/4	36-1/4	26-1/4	229.30	239.80	1063

Cv = Gallons per minute at 1 psi pressure drop.

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 8"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0-	-0-	-0-	-0-	-0-	-0-	-0-
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0-
	10" - 12"	PVC	50 (.34)	45 (.31)	40 (.30)	35 (.24)	30 (.21)	-0-	-0-	-0-	-0-	-0-	-0-	-0-
		CPVC	50 (.34)	47 (.32)	45 (.31)	42 (.83)	40 (.30)	37 (.26)	35 (.24)	30 (.21)	25 (.17)	20 (.14)	15 (.10)	-0-

ASTRAL CORZAN™
INDUSTRIAL PIPING SYSTEMS

CPVC
INJECTION MOLDED
CLASS 150 FLANGES

CPVC INJECTION MOLDED CLASS 150 FLANGES

Technical Information

Application

Molded CLASS 150 Flange fittings are coupling devices designed for joining IPS (Iron Pipe Size) plastic piping systems, where frequent disassembly may be required, and can be used as a transitional fitting for joining plastic to metal piping systems. Suitability of application is at the discretion of the user.

Pressure Rating

150 psi, water at 73°F.

Flange Types

One Piece — Available in socket configuration, sizes 1/2" through 8"; threaded and SR threaded (Special Reinforced) configuration sizes 1/2" through 4".

Van Stone Style — Two-piece design with rotating flange ring, available in socket configurations, sizes 1/2" through 16"; thread configurations, sizes 1/2" through 4" and spigot configurations, sizes 1/2" through 12"

Blind — Closed ring design for capping off a mating flange, flanged fitting or flanged valve, available in sizes 1/2" through 12".

Materials

All injection molded flanges are produced from either PVC or CPVC materials approved for potable water use by the National Sanitation Foundation (NSF).

Glass-filled PVC or CPVC materials may be used in certain Van Stone Style flange-rings and large diameter Blind flanges where additional reinforcement is deemed necessary.

Conformance Standards

Socket & Spigot — ASTM D 2467 (PVC); ASTM F 439 (CPVC), as applicable.

Threads — ASTM F 1498.

Bolt Hole Pattern — ANSI B16.5; ASTM D 4024.

Material — ASTM D 1784 (PVC Cell Classification 12454-B, CPVC Cell Classification 23447-B).

Weights & Dimensions

Specified minimum bolt lengths are based on the use of two Spears® Flanges, two standard flat washers, standard nut and 1/8" thick elastomer full face gasket. Mating with other brands or accessories may require variation. Bolts and gaskets are not supplied with flanges.

Dimension references:

L = Overall length of hub, ± 1/16 inch.
M = Outside diameter of socket hub, ± 1/16 inch.
N = (Laying Length) socket/spigot bottom to seal-ring face of flange, ± 1/16 inch.
R = Height (thickness) of flange ring, ± 1/16 inch.
Max O.D. = Outside diameter of ring, ± 1/16 inch.
Bolt Circle Diameter = ANSI B 16.5 Standard; ASTM D 4024, ± 1/16 inch.

THERMOPLASTIC FLANGES

Bolt Torque

Recommended Bolt Torque is shown in **Table 1.** Threads should be clean and well lubricated. Actual field conditions may require variations in these recommendations. ***CAUTION: UNNECESSARY OVER TORQUING WILL DAMAGE THE FLANGE.***

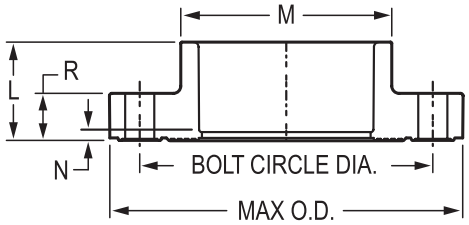
Table1

Flange Size (in.)	Recommended Torque (ft. lbs.)
1/2-1-1/2	12
2-4	25
5	30
6-8	40
10	64
12	95

CPVC INJECTION MOLDED CLASS 150 FLANGES

Flange One Piece

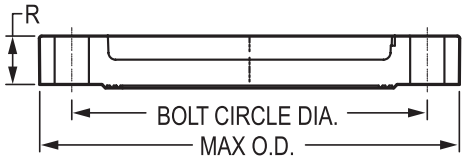
Socket



Part Number	Size	L	M	N	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max O.D.	Approx. Wt. (Lbs.)
CPVC											CPVC
851-005C	1/2	1-1/16	1-9/32	1/8	9/16	2-3/8	4	1/2	2	3-1/2	.24
851-007C	3/4	1-3/16	1-1/2	1/8	5/8	2-3/4	4	1/2	2	3-7/8	.31
851-010C	1	1-5/16	1-13/16	3/16	3/4	3-1/8	4	1/2	2-1/4	4-1/4	.47
851-012C	1-1/4	1-7/16	2-7/32	3/16	23/32	3-1/2	4	1/2	2-1/4	4-5/8	.42
851-015C	1-1/2	1-23/32	2-1/2	1/4	3/4	3-7/8	4	1/2	2-1/2	5	.73
851-020C	2	1-27/32	3	3/8	13/16	4-3/4	4	5/8	3	6	.90
851-025C	2-1/2	2-1/4	3-1/2	1/2	1	5-1/2	4	5/8	3-1/4	7	1.67
851-030C	3	2-5/16	4-9/32	15/32	1-1/16	6	4	5/8	3-1/4	7-1/2	1.85
851-040C	4	2-5/8	5-7/16	1/4	1-1/4	7-1/2	8	5/8	3-1/2	9	3.17
851-050C	5	3-1/4	6-3/8	1/4	1	8-1/2	8	3/4	3-3/4	10-1/8	3.17
851-060C	6	3-1/4	7-9/16	1/4	1-3/8	9-1/2	8	3/4	4	11	4.64
851-080C	8	4-9/16	9-3/4	9/16	1-7/16	11-3/4	8	3/4	4-1/2	13-1/2	7.36

CPVC INJECTION MOLDED CLASS 150 FLANGES

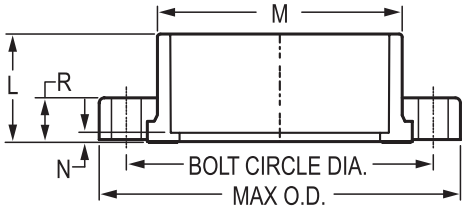
BLIND FLANGE



Part Number	Size	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max. O.D.	Approx. Wt. (Lbs.)
CPVC								CPVC
853-005C	1/2	9/16	2-3/8	4	1/2	2	3-1/2	.21
853-007C	3/4	5/8	2-3/4	4	1/2	2	3-7/8	.30
853-010C	1	3/4	3-1/8	4	1/2	2-1/4	4-1/4	.47
853-012C	1-1/4	23/32	3-1/2	4	1/2	2-1/4	4-5/8	.40
853-015C	1-1/2	3/4	3-7/8	4	1/2	2-1/2	5	.54
853-020C	2	13/16	4-3/4	4	5/8	3	5-15/16	.88
853-025C	2-1/2	1	5-1/2	4	5/8	3-1/4	7	1.36
853-030C	3	1-1/16	6	4	5/8	3-1/4	7-5/8	1.66
853-040C	4	1-1/4	7-1/2	8	5/8	3-1/2	9	2.78
853-060C	6	1-3/8	9-1/2	8	3/4	4	11	3.93
853-080C	8	1-7/16	11-3/4	8	3/4	4-1/2	13-1/2	7.20
853-100C	10	1-11/16	14-1/4	12	7/8	5	16	11.80
853-120C	12	1-11/16	17	12	7/8	5	19	17.58

Flange Van Stone Style

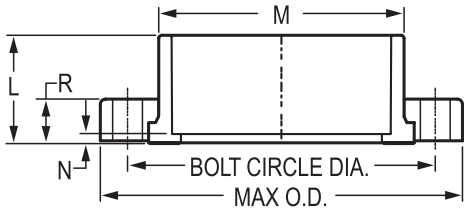
(Two-Piece)
Socket



Part Number	Size	L	M	N	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max O.D.	Approx. Wt. (Lbs.)
CPVC											CPVC
854-005C	1/2	1-1/32	1-7/32	5/32	17/32	2-3/8	4	1/2	2	3-1/2	.20
854-007C	3/4	1-1/8	1-7/16	5/32	9/16	2-3/4	4	1/2	2	3-7/8	.27
854-010C	1	1-9/32	1-3/4	5/32	5/8	3-1/8	4	1/2	2-1/4	4-1/4	.37
854-012C	1-1/4	1-13/32	2-5/32	5/32	11/16	3-1/2	4	1/2	2-1/4	4-5/8	.45
854-015C	1-1/2	1-17/32	2-7/16	3/16	3/4	3-7/8	4	1/2	2-1/2	5	.60
854-020C	2	1-11/16	2-15/16	3/16	13/16	4-3/4	4	5/8	3	6	.91

Flange Van Stone Style (continued)

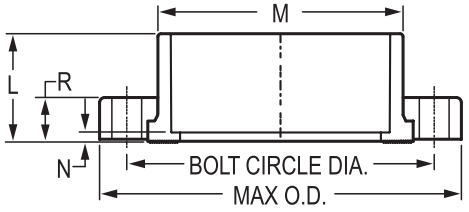
(Two-Piece)
Socket



Part Number	Size	L	M	N	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max O.D.	Approx. Wt. (Lbs.)
CPVC											CPVC
854-025C	2-1/2	2	3-1/2	3/16	31/32	5-1/2	4	5/8	3-1/4	7	1.40
854-030C	3	2-1/8	4-1/4	1/4	1-1/16	6	4	5/8	3-1/4	7-1/2	1.70
854-040C	4	2-1/2	5-1/4	1/4	1-1/8	7-1/2	8	5/8	3-1/2	9	2.84
854-050C	5	3	6-1/4	3/8	1-1/8	8-1/2	8	3/4	3-3/4	10-1/8	3.60
854-060C	6	3-3/8	7-9/16	7/16	1-9/32	9-1/2	8	3/4	4	11	4.67
854-080C	8	4-3/8	9-5/16	3/8	1-3/8	11-3/4	8	3/4	4-1/2	13-1/2	7.06
854-100C	10	5-11/16	11-3/4	11/16	1-5/8	14-1/4	12	7/8	5	16	11.76
854-120C	12	7-1/4	13-3/4	5/8	1-1/2	17	12	7/8	5	19	18.50

Flange Van Stone Style

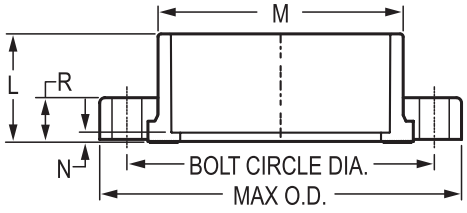
with Plastic Solid Ring
(Two-Piece)
Socket



Part Number	Size	L	M	N	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max O.D.	Approx. Wt. (Lbs.)
CPVC											CPVC
--	2	1-11/16	2-15/16	3/16	13/16	4-3/4	4	5/8	3	6	--
S854-030C	3	2-1/8	4-1/4	1/4	1-1/16	6	4	5/8	3-1/4	7-1/2	1.70
S854-040C	4	2-1/2	5-1/4	1/4	1-1/8	7-1/2	8	5/8	1/2	9	2.84
S854-060C	6	3-3/8	7-9/16	7/16	1-9/32	9-1/2	8	3/4	4	11	4.67

Flange Van Stone Style (continued)

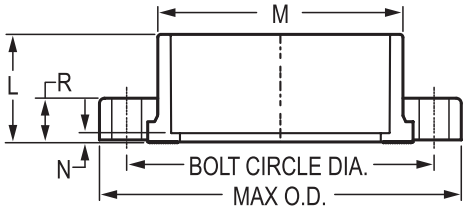
with Plastic Solid Ring
(Two-Piece)
Socket



Part Number	Size	L	M	N	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max O.D.	Approx. Wt. (Lbs.)
CPVC											CPVC
S854-080C	8	4-3/8	9-5/16	3/8	1-3/8	11-3/4	8	3/4	4-1/2	13-1/2	7.06
S854-100C	10	5-11/16	11-3/4	11/16	1-5/8	14-1/4	12	7/8	5	16	11.76
S854-120C	12	7-1/4	13-3/4	5/8	1-3/4	17	12	7/8	5	19	19.13

Flange Van Stone Style

with Multi-Bolt Pattern Ring
(Two-Piece)
Socket

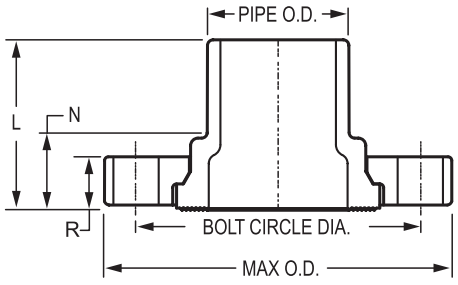


Part Number	Size	L	M	N	R	Bolt Circle Dia.		No. of Bolt Holes	Bolt Size	Max O.D.	Approx. Wt. (Lbs.)
CPVC						Min	Max				CPVC
M854-020C	2	1-11/16	2-15/16	3/16	13/16	4-1/2	4-15/16	4	5/8	6	.93
M854-030C	3	2-1/8	4-1/4	1/4	1-1/16	5-13/16	6-11/32	8	5/8	7-1/2	1.78
M854-040C	4	2-1/2	5-1/4	1/4	1-1/8	7-3/32	7-1/2	8	5/8	9	2.96
M854-060C	6	3-3/8	7-9/16	7/16	1-9/32	9-7/32	9-1/2	8	3/4	11	5.09
M854-080C	8	4-3/8	9-5/16	3/8	1-3/8	11-1/2	11-3/4	8	3/4	13-1/2	7.21

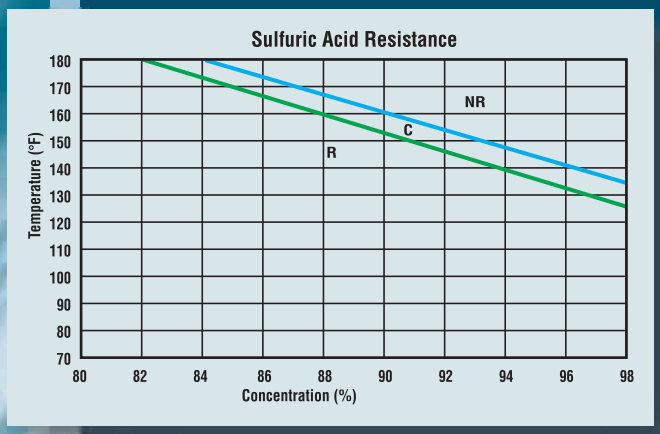
CPVC INJECTION MOLDED CLASS 150 FLANGES

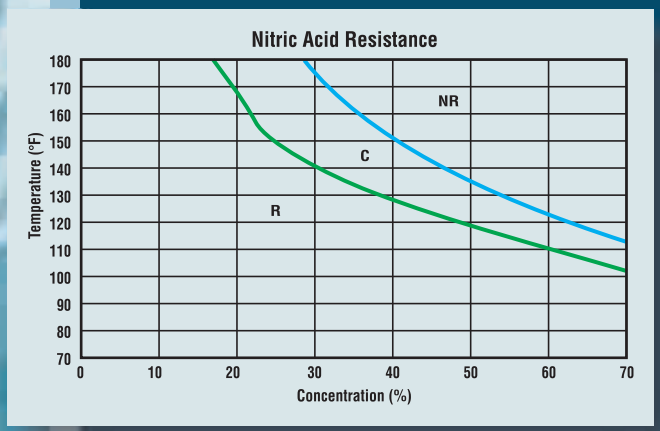
Flange Van Stone Style

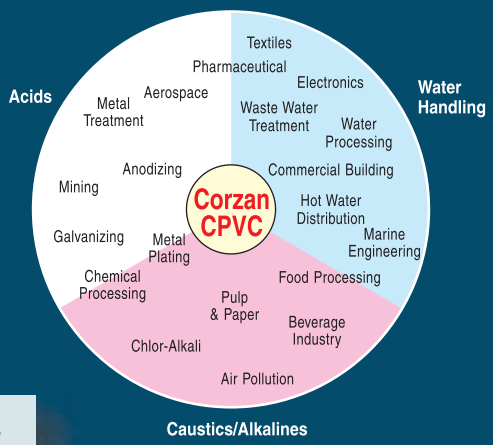
(Two-Piece)
Spigot



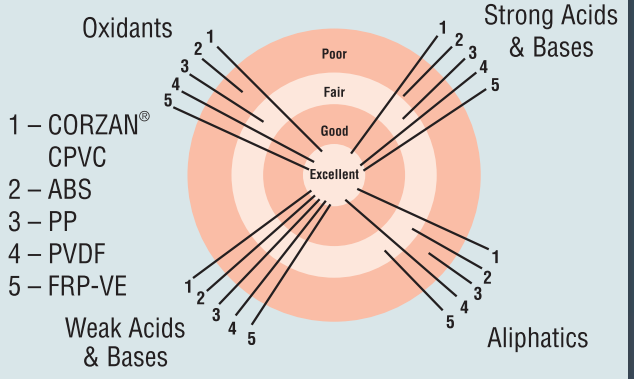
Part Number	Size	L	N	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max. O.D.	Approx. Wt. (Lbs.)
CPVC										CPVC
856-005C	1/2	1-3/4	29/32	17/32	2-3/8	4	1/2	2	3-1/2	.21
856-007C	3/4	1-15/16	31/32	9/16	2-3/4	4	1/2	2	3-7/8	.30
856-010C	1	2-3/16	1-1/32	5/8	3-1/8	4	1/2	2-1/4	4-1/4	.41
856-012C	1-1/4	2-11/32	1-3/32	11/16	3-1/2	4	1/2	2-1/4	4-5/8	.50
856-015C	1-1/2	2-5/8	1-9/32	3/4	3-7/8	4	1/2	2-1/2	5	.65
856-020C	2	2-7/8	1-11/32	13/16	4-3/4	4	5/8	3	6	1.00
856-025C	2-1/2	3-1/16	1-9/32	1	5-1/2	4	5/8	3-1/4	7	1.54
856-030C	3	3-3/8	1-7/16	1-1/16	6	4	5/8	3-1/4	7-1/2	1.88
856-040C	4	3-7/8	1-5/8	1-1/4	7-1/2	8	5/8	3-1/2	9	3.12
856-060C	6	4-3/4	1-25/32	1-9/32	9-1/2	8	3/4	4	11	4.79
856-080C	8	5-7/8	1-15/16	1-3/8	11-3/4	8	3/4	4-1/2	13-1/2	8.17
856-100C	10	8	2-1/4	1-5/8	14-1/4	12	7/8	5	16	16.09
856-120C	12	8-1/2	2-3/16	1-5/8	17	12	7/8	5	19	22.70







Chemical Resistance of Thermoplastics



INTRODUCTION

All process industries such as Chemical, Food and Beverages industries, Paper and Pulp, Metal Treating, Industrial Wastage Treatment etc. ....are facing acute problems of maintenance due to aggressive corrosion in their piping system resulting into heavy leakages, flow restrictions and ultimately premature failures.

These problems which occur regularly during the working of the plant put the industry into great financial strain.

To overcome these unwanted hazards, ASTRAL has come up with authentic source of high quality thermoplastic, Industrial Piping System.

QUALITY

The CPVC products as mentioned below are exactly as per ASTM & NATIONAL SANITATION FOUNDATION standards for material purity, dimensional accuracy and pipe performance services.

PRODUCTS

(1) CORZAN™ CPVC PIPES Schedules 40 & 80 : 15 mm (½") to 300 mm (12")

(2) CORZAN™ CPVC FITTINGS, VALVES AND FLANGES

CORZAN™ products are being manufactured from Lubrizol's Corzan™ CPVC compound under the licence from Lubrizol Advanced Materials. Astral follows the strict quality control specifications of Lubrizol Advanced Materials.

SERVICE

ASTRAL is committed to meet the needs of such industries. The ultimate goal of Astral Engineering Division is to serve maximum for the benefit of industries.

The production of the said Corzan™ CPVC Industrial system from ASTRAL comprises of highly advanced technology with complete infrastructure such as Problem Solving, Technical Guidance, Sharing / Update latest developments in the technology.

ASTRAL®
where ***INNOVATION*** *flows*

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