



# MARYLAND PIPE & SUPPLY CO., LLC



## PVC

### SUBMITTAL AND DATA SHEET

**STANDARDS: ASTM D1784, ASTM D1785, ASTM D2672, ASTM F480, ASTM D2466, ASTM D2467, ASTM D2464, ASTM D2241, ASTM D672, ASTM F1970**

**NSF 14, NSF 61**

**CSA B137.0, CSA B137.3, CSA B181.2**

(Please see our listing on agency websites for NSF and CSA complaint fittings. [www.nsf.org](http://www.nsf.org) [www.CSAGroup.org](http://www.CSAGroup.org) )

#### Introduction:

PVC is the most frequently specified of all thermoplastic piping materials. It has been used successfully for over 60 years. PVC is characterized by distinctive physical properties, and is resistant to corrosion and chemical attack by acids, alkalis, salt solutions and many other chemicals. It is attacked, however, by polar solvents such as ketones and aromatics.

Of the various types and grades of PVC used in plastic piping, Type 1, Grade 1 PVC (Cell Classification 12454) conforming to ASTM D1784, is the most common. The maximum service temperature for PVC is 140°F (60°C), under pressure. PVC for drainage applications is also capable of handling near boiling temperatures for intermittent flow conditions. With a hydrostatic design basis of 4,000psi at 73°F (23°C) and a design stress of 2,000psi at 73°F (23°C), PVC has the highest long-term hydrostatic strength of any other major thermoplastic material used for piping.

Material Properties		
Properties	PVC	Standards
Specific gravity	1.42	ASTM D792
Tensile strength, psi at 73°F	7,000	ASTM D638
Modulus of elasticity tensile, psi at 73°F	400,000	ASTM D638
Flexural strength, psi	14,500	ASTM D790
Izod impact, ft.lbs/in. at 73°F, notched	0.65	ASTM D256
Compressive strength, psi	9,000	ASTM D695
Poisson's ratio	0.38	
Working stress, psi at 73°F	2,000	
Coefficient of thermal expansion in./in./°F (x10 <sup>-5</sup> )	3	ASTM D696
Linear expansion, in./10°F per 100' of pipe	0.36	
Maximum operating temperature under pressure	140°F (60°C)	
Deflection temperature under load, °F at 66 psi	173	ASTM D648
Deflection temperature under load, °F at 264 psi	160	ASTM D648
Thermal conductivity, BUT.in./hr.ft <sup>2</sup> .°F	1.2	ASTM C177
Burning rate	Self extinguish	ASTM D635
Flash ignition, °F	V-0	UL-94
Limited oxygen index (%)	43	ASTM D2863-70
Water absorption, %, (24 hrs. at 73°F)	0.05	ASTM D570

Pipe Availability		
Pipe Size		
Schedule 40 White	Schedule 40 Grey	Schedule 80 Grey
1/2" – 24"	2" – 16"	1/4" – 24"

<b>Molded Fittings Availability</b>		
<b>Fittings</b>	<b>Schedule 40 Size (inches)</b>	<b>Schedule 80 Size (inches)</b>
Tee (Soc)	1/2 - 12	1/4 - 12
Reducing Tee (Soc)	1/2 - 8 x 1/2 - 8 x 1/2 - 6	3/4 - 8 x 8 x 1/2 - 6
Tee (Soc x Soc X Fpt)	1/2 - 4	1/2 - 1
Reducing Tee (Soc x Soc x Fpt)	1/2 - 8 x 1/2 - 8 x 1/2 - 4	N/A
Tee (Fpt)	1/2 - 2	1/4 - 4
90° Elbow (Soc)	1/2 - 12	1/4 - 12
90° Elbow (Soc x Fpt)	1/2 - 4	1/2 - 2
90° Elbow (Fpt)	1/2 - 2	1/4 - 4
90° Elbow Reducing (Soc)	3/4 - 2 x 1/2 - 1-1/2	N/A
90° Elbow Reducing (Soc x Fpt)	1/2 - 2 x 1/2 - 1-1/2	N/A
90° Elbow (Mpt x Soc)	1/2 - 2	N/A
90° Elbow (Spig x Soc)	1/2 - 2	N/A
90° Elbow (Mpt x Fpt)	1/2 - 2	N/A
90° Street Elbow (Spig x Soc)	1/2 - 2	N/A
90° Street Elbow (Mpt x Fpt)	1/2 - 2	N/A
Side Outlet Elbow (Soc)	1/2	N/A
Side Outlet Elbow (Soc x Soc x Fpt)	1/2 - 1 x 1/2 - 1 x 1/2 - 3/4	N/A
45° Elbow (Soc)	1/2 - 12	1/4 - 12
45° Elbow (Fpt)	N/A	1/4 - 4
22-1/2° Elbow (Soc)	N/A	2 - 4
30° Elbow	N/A	6
Hose Adapter (Insert x Soc)	1/2 - 4	N/A
Hose Adapter (Insert x Mpt)	1/2 - 4	N/A
Cross (Soc)	1/2 - 4	1/2 - 4
Coupling (Fpt)	1/2 - 1	1/4 - 4
Coupling (Soc)	3/8 - 8	1/4 - 8
Reducer Coupling (Soc)	3/4 - 6 x 1/2 - 4	3/4 - 8 x 1/2 - 6
Reducer Coupling (Fpt)	N/A	1/2 - 2 x 1/4 - 1 - 1/2
Female Adapter (Soc x Fpt)	1/2 - 8	1/4 - 4
Female Adapter Reducer (Soc x Fpt)	1/2 - 1 x 1/4 - 1	N/A
Female Adapter (Spig x Fpt)	1/2 - 4	1/2 - 4
Male Adapter (Soc x Mpt)	3/8 - 8	1/2 - 4
Male Adapter Reducing (Soc x Mpt)	1/2 - 4 x 1/2 - 3	N/A
IPS to PIP Adapter (Spig x Soc)	6 - 8	N/A
Riser Extension (Fpt x Mpt)	1/2 - 1	N/A
Reducer Bushing (Spig x Soc)	1/2 - 8 x 1/4 - 6	3/8 - 8 x 3/8 - 6
Reducer Bushing (Spig x Fpt)	1/2 - 6 x 3/8 - 5	3/8 - 6 x 3/8 - 4
Reducer Bushing (Mpt x Fpt)	3/8 - 3 x 3/8 - 2-1/2	3/8 - 4 x 3/8 - 3
Cap (Soc)	3/8 - 8	1/4 - 8
Cap (Fpt)	3/8 - 6	1/4 - 4
Plug (Spig)	3/8 - 4	2
Plug (Mpt)	3/8 - 6	1/4 - 6
Wye (Soc)	1-1/2 - 2	1-1/2 - 2
Saddles (Soc)	2-1/2 - 10 x 3/4 - 4	N/A
Saddles (Fpt)	2-1/2 - 10 x 3/4 - 4	N/A

<b>Fabricated Fittings Availability</b>		
<b>Fittings</b>	<b>Schedule 40 Size (inches)</b>	<b>Schedule 80 Size (inches)</b>
Fabricated Tee (Soc)	10 – 24	10 – 16
Fabricated Reducing Tee (Soc)	10 – 24 x 10 – 24 x 4 – 20	8 – 16 x 8 – 16 x 4 – 14
Fabricated 45° Elbow (Soc)	10 – 18	10 – 16
Fabricated 22-1/2° Elbow (Soc)	10 – 18	10 – 16
Fabricated Cross (Soc)	N/A	6 – 10
Fabricated Reducing Cross (Soc)	8 – 16 x 4 – 14	N/A
Fabricated Coupling (Soc)	10 – 24	10 – 16
Fabricated Concentric Reducing Coupling (Soc)	N/A	8 – 16 x 4 – 14
Fabricated Eccentric Reducing Coupling (Soc)	10 – 12 x 4 – 10	N/A
Fabricated Reducer Bushing (Spig x Soc)	10 – 12 x 4 – 10	10 – 16 x 4 – 14
Fabricated Cap (Soc)	10 – 24	10 – 16
Fabricated Wye (Soc)	8 – 16	8 – 14
One Piece Fabricated Flange (Soc)	N/A	10 – 16
Fabricated Bling Flange	N/A	10 – 16
Fabricated Vanstone Flange (Soc)	N/A	18 – 24
Nipples	N/A	1/4 – 4
Expansion Joints	N/A	1/2 – 4
Heavy Duty Vanstone Flange (Soc)	N/A	14 – 16

<b>ASTM F1970 Fittings Availability</b>	
<b>Fittings</b>	<b>Size (inches)</b>
Union (Soc)	1/4 – 4
Union (Fpt)	1/4 – 4
One Piece Flange (Soc)	1/2 – 8
One Piece Flange (Fpt)	1/2 – 6
Blind Flange	1/2 – 8
Heavy Duty Vanstone Flange (Spig)	3 – 8
Vanstone Flange (Spig)	1/2 – 12
Heavy Duty Vanstone Flange (Soc)	1-1/2 – 12
Vanstone Flange (Soc)	1/2 – 12
Vanstone Flange (Fpt)	1/2 - 4

PVC Manufacturers: Charlotte, Cresline, Genova, Heritage, I-Pex, JM Eagle, Lesso, North America Pipe, Silver Line.

PVC Fittings Manufacturers: Charlotte, Lasco, Genova, Lesso, Spears.

## **Schedule 40 & 80 PVC industrial pipe and fittings**

### **SCOPE**

This specification sheet covers the manufacturers' requirements for PVC Schedule 40 and Schedule 80 IPS pressure pipe. The pipe and fittings meet or exceed all applicable ASTM, NSF and CSA standards and are suitable for potable water.

### **PVC MATERIALS**

Rigid PVC (polyvinyl chloride) used in the extrusion of Schedule 40 & 80 pipe and fittings complies with the material requirements of ASTM D1784 (formerly Type 1, Grade 1) and has a cell classification of 12454. Raw material used in the extrusion shall contain the standard specified amount of color pigment, stabilizers and other additives. The compounds used are listed to the requirements of NSF 61 for use in potable water service.

### **DIMENSIONS**

Physical dimensions and properties of PVC Schedule 40 and 80 pipe and fittings shall meet the requirements of ASTM D1785 and/or be certified to CSA B137.3. Socket dimensions of belled end pipe shall meet the requirements of ASTM D2672 or F480.

### **MARKING**

PVC Schedule 40 and 80 pipe is marked as prescribed in ASTM D1785, NSF 14 and/or CSA B137.0/137.3. The marking includes the following: IPS PVC and the Schedule and Pressure Rating at 73°F (23°C); ASTM D1785; CSA B137.3; NSF 14; and NSF 61 Potable.

## **PVC SDR PRESSURE RATED PIPE**

### **SCOPE**

This specification sheet covers the manufacturers' requirements for PVC Standard Dimension Ratio (SDR) pressure rated pipe. The pipe meets or exceeds all applicable ASTM, NSF and CSA standards and is suitable for potable water.

### **PVC MATERIALS**

Rigid PVC (polyvinyl chloride) used in the extrusion of SDR pressure rated pipe complies with the material requirements of ASTM D1784 (formerly Type 1, Grade 1) and has a cell classification of 12454. Raw material used in the extrusion shall contain the standard specified amounts of color pigment, stabilizers and other additives. The compounds used are listed to the requirements of NSF 61 for use in potable water service.

### **DIMENSIONS (PLAIN END)**

Physical dimensions and properties of PVC SDR pressure rated pipe shall meet the requirements of ASTM D2241 (available in sizes ½" through 48") and CSA B137.3.

### **MARKING**

PVC SDR rated pressure pipe is marked as prescribed in ASTM D2241 and/or CSA B137.3 as follows: PVC; SDR# and/or the pressure rating in psi for water at 73°F (23°C); ASTM D2241; CSA B137.3; and NSF 61 potable.

### **SAMPLE SPECIFICATION**

All PVC SDR/PR 160 and 200 pipe shall conform to ASTM D2241 and/or CSA B37.0/B137.3. Belled ends shall meet the requirements of ASTM D672 or ASTM F80.

## **Drain, Waste & Vent Pipe (DWV)**

### **SCOPE**

This specification sheet covers the manufacturers' requirements for PVC DWV pipe. This pipe meets or exceeds all applicable ASTM, NSF and CSA standards.

### **PVC MATERIALS**

Rigid PVC (polyvinyl chloride) used in the extrusion of DWV pipe complies with the material requirements of ASTM D1784 (formerly Type 1, Grade 1) and has a cell classification of 12454.

### **DIMENSIONS**

Physical dimensions and tolerances of PVC DWV pipe shall meet the requirements of ASTM D2665 or CSA B181.2.

### **MARKING**

PVC DWV pipe is marked as prescribed in ASTM D2665 or CSA B181.2. The marking includes the following: nominal pipe size; PVC-DWV; ASTM D2665, NSF 14 or CSA B181.2.

### **SAMPLE SPECIFICATION**

All PVC DWV pipe shall conform to ASTM D1785 and/or CSA B181.2.

## **FABRICATED FITTINGS**

### **Pressure Rating**

The pressure rating of the fitting shall be the same as that of the pipe used in the fabrication of the fitting. The pipe shall be certified to CSA B137.3 and NSF 14.

### **Hydrostatic Pressure Test of Fittings**

At the engineer's or customer's request, representative sample fittings may be assembled and pressure tested for 1,000 hours at 1-1/2 times the pressure rating of the pipe at 73°F (23°C). At the end of the 1,000 hours, the pressure shall be increased to 2-1/2 times the pressure rating within two minutes. No failure shall occur.

### **Quality Control Tests**

Joints from fittings shall be subjected to a spark test (power source of 24,000 volts). The joint shall not permit any passage of spark at any point along the weld.

### **Fiberglass Reinforcing**

Fiberglass reinforcing should be applied to the fitting in such a manner and thickness to meet the hydrostatic pressure requirements specified. Bonding shall be done with primer resin to provide an adequate bond to the PVC pipe.

### **Marking**

All fittings to have an exterior label identifying size, configuration, pressure rating and manufacturer's name.

### **Socket Weld Depths**

Each solvent weld bell must have a minimum socket depth of one-half times the pipe diameter.

### **One-Source Supply**

All components of a piping system including pipe, fittings and valves, shall be supplied by one manufacturer.

