Charlotte Pipe’s Retail Division

Charlotte Pipe and Foundry Company is the largest manufacturer of DWV pipe and fitting systems in the country, producing the industry’s broadest range of standard and specialty DWV products.

Our product line includes ABS, PVC, and CPVC CTS FlowGuard Gold® pipe and fittings for both residential and commercial plumbing systems. Sizes range from ¼ to 16 inches, based on material.

In fact, we employ more than 1,500 loyal, hard-working associates, have six extrusion plants and are headquartered in Charlotte, NC. This gives us the capacity to fill orders completely and in a timely manner.

Advantages to Choosing Charlotte Pipe

Along with an extensive line of quality products, Charlotte Pipe is known for customer service. We take care of our customers’ needs during the order process and beyond. We have dedicated associates for account management, customer service, assortment planning, e-commerce and more.

We also offer numerous electronic services including our website, charlottepipes.com/retail, and Charlotte Pipe Connect, our database of product information that provides information for your e-commerce sites and internal databases.

In addition, our services include Electronic Data Interchange (EDI), order confirmation and Advanced Shipment Notifications (ASN), invoice options and Automatic Clearing House (ACH) payments – all designed to make it easy for you to do business with Charlotte Pipe.
Retail Services Include:

- Technologically Advanced Manufacturing Facilities
- Planogram Support
- Bin Tags and Header Boards Offered

Our hundreds of thousands of square feet of modern warehouse space stocked with inventory, along with investments in the latest tooling and machinery, make it possible for us to meet increasing demand for our products and to produce the highest-quality pipe and fittings in the industry. This includes a quality barcode and/or labeling on each product.

Charlotte Pipe provides support for planograms, including field support, product market research analysis, and product sequencing. POP signage such as bin tags and header boards can be ordered via our online shop. Hardcopy product literature is also available to order on our online shop at no charge to our customers.
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# Common Industry Abbreviations

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<th>Abbreviation</th>
<th>Description</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>Acrylonitrile Butadiene Styrene</td>
<td>MPT</td>
<td>Male Pipe Thread</td>
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<td>ASTM</td>
<td>American Society for Testing and Materials</td>
<td>NSF</td>
<td>National Sanitation Foundation</td>
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<tr>
<td>CPVC</td>
<td>Chlorinated Polyvinyl Chloride</td>
<td>OD</td>
<td>Outside Diameter</td>
</tr>
<tr>
<td>CTS</td>
<td>Copper Tube Size</td>
<td>PSI</td>
<td>Pounds per Square Inch</td>
</tr>
<tr>
<td>DWV</td>
<td>Drain, Waste, Vent</td>
<td>PVC</td>
<td>Polyvinyl Chloride</td>
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<tr>
<td>FIP</td>
<td>Female Iron Pipe Size</td>
<td>S</td>
<td>Socket</td>
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<tr>
<td>FPT</td>
<td>Female Pipe Thread</td>
<td>SPG</td>
<td>Spigot</td>
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<tr>
<td>H</td>
<td>Hub</td>
<td>¼ bend</td>
<td>90-degree bend</td>
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<tr>
<td>ID</td>
<td>Inside Diameter</td>
<td>½ bend</td>
<td>60-degree bend</td>
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<tr>
<td>IPS</td>
<td>Iron Pipe Size</td>
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<td>45-degree bend</td>
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<tr>
<td>MIP</td>
<td>Male Iron Pipe Size</td>
<td>⅛ bend</td>
<td>22.5-degree bend</td>
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### Pipe Reference Guide

<table>
<thead>
<tr>
<th>Product</th>
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<td>FlowGuard Gold® CPVC CTS SDR 11</td>
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| PVC Schedule 80                 | ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● }}

*Non-Pressure
PVC Schedule 40 DWV Pipe and Fittings
• Most widely used material today.
• Manufactured from polyvinyl chloride.
• White in color.
• Use correct primer and cement.

ABS Schedule 40 DWV Pipe and Fittings
• Manufactured from acrylonitrile butadiene styrene.
• Black in color.
• More common in the western U.S.
• Use correct cement.

PVC SDR 35 ASTM D 3034 Sewer Main Pipe
• Manufactured from polyvinyl chloride.
• Green in color.
• Used in sanitary sewer applications.
• Available in gasketed or solvent weld.

PVC Sewer and Drain Pipe
• Manufactured from polyvinyl chloride.
• ASTM D 2729.
• White in color.
• Perforated or solid wall.
• Applications include leach fields, downspout drainage, French drains.

Drainage (DWV) Fitting Pattern
Sanitary Turn

DWV stands for:
D = drains from tubs and sinks
W = waste from toilets
V = vents for air into/out of the system
PVC Schedule 40 DWV Pipe & PVC DWV Fittings For Non-Pressure Applications

Note: Solid Wall and Cellular Core Pipe

PVC DWV Fittings can be installed with cellular core pipe or “dual marked” solid wall pipe.

ASTM F 891 cellular core pipe is lighter, cuts faster and costs less. Never use for pressure applications.

Solid wall PVC pipe is often rated for both pressure (ASTM D 1785) and non-pressure (ASTM D 2665) applications — often referred to as “dual marked.” When solid wall or cellular core pipe is used with PVC DWV fittings, the resulting system is NOT pressure rated.

Description

- Rigid pipe and fittings.
- Pipe and fittings are white in color.
- Joined with solvent cement conforming to applicable ASTM standards.
- Fittings have a gradual sanitary turn.

Application

- Drain household sanitary waste (kitchen, bathroom).
- Sanitary sewer.
- Drain ground water.
- NOT for pressure applications.
- NOT for compressed air or gasses.
PVC Schedule 40 DWV Pipe & PVC DWV Fittings For Non-Pressure Applications

>> Standards
- ASTM D 1785 Schedule 40 Solid Wall PVC Pipe
- ASTM F 891 Cellular Core PVC DWV Pipe
- ASTM D 2665 PVC DWV Pipe & Fittings
- NSF Standard 14

>> Dimensional Standard
- Schedule 40 Iron Pipe Size (IPS)

>> Cell Class
- 12454 PVC Solid Wall Pipe & Fittings
- 11432 PVC DWV Cellular Core Pipe

>> Maximum Working Temperature
- 140° F

>> Maximum Working Pressure
- 0 (zero) PSI
- PVC DWV is NOT a pressure-rated piping system.
- Recommended test is 10 feet of hydrostatic pressure, which equals 4.3 PSI.

>> Joining Method
Solvent Weld Joints
- Solvent cements must meet ASTM D 2564.
- Primer is required.
- May be joined with a slip joint compression fitting (a trap adapter, for example).

Threaded Joints
- Threading PVC 40 pipe is NOT recommended.
- Male Iron Pipe size (MIP) and Female Iron Pipe size (FIP) adapters are available.
## PVC Schedule 40 DWV Pipe & PVC DWV Fittings For Non-Pressure Applications

### Product Offering/Data

**ASTM D 1785 & ASTM D 2665**  
**Dual Marked Pipe**

<table>
<thead>
<tr>
<th>Size</th>
<th>OD</th>
<th>Nominal ID</th>
<th>Min Wall</th>
<th>Weight Per 100 ft. (lbs.)</th>
<th>Skid Quantity 10 ft. pcs/skid</th>
<th>Skid Quantity 20 ft. pcs/skid</th>
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</table>
PVC & ABS DWV Fittings For Non-Pressure Applications

The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

Coupling
Part No. PVC 100
• Used to join two pipes together; extend pipe.
  • H x H

Trap Adapter, Male with 1½” Plastic Nut and Washers to Fit 1½” and 1¼” Traps
Part No. PVC 103R
• Used to secure the sink drain line to the P-Trap.
  • SPG x Slip w/ plastic nut

Trap Adapter, Female
Part No. PVC 104P
• Used to secure the sink drain line to the P-Trap.
  • H x Slip w/ washer and polyethylene nut

Flush Bushing
Part No. PVC 107
• Used to connect two pipes of different diameters.
  • SPG x H

Male Adapter, octagon shoulders for tightening purposes
Part No. PVC 109
• Has male threads on one end and the other end adapts to the pipe being used.
  • H x MPT

1/4 Bend
Part No. PVC 300
• Used to turn pipe 90 degrees; also called a 90 degree Elbow.
  • H x H

1/8 Bend
Part No. PVC 321
• Used to turn pipe 45 degrees; also called a 45 degree Elbow.
  • H x H

Sanitary Tee
Part No. PVC 400
• Used to connect three lines together or to branch off a main line.
  • All Hub
The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

Female Adapter
Part No. PVC 101
• Has female threads on one end and the other end adapts to the type of pipe being used.
  • FPT x H

Pipe Increaser-Reducer
Part No. PVC 102
• Used to join two pipes of different diameters together. For DWV applications, diameter cannot be reduced downstream.
  • H x H

Cleanout Adapter with Cleanout Plug
Part No. PVC 105X
• Used to seal off pipe, fittings and cleanouts.
  • Spigot

Cleanout Plug
Part No. PVC 106
• Screws into cleanout adapter to seal off a pipe.
  • MPT

Flush Cleanout Plug
Part No. PVC 110
• Screws into cleanout adapter to seal off a pipe.
  • MPT

Cap
Part No. PVC 116
• Used to seal off the end of a pipe.
  • Socket

1/4 Bend, Street
Part No. PVC 302
• Used to turn the pipe 90 degrees.
  • One end is spigot and the other end is hub.
  • SPG x H

Long Sweep 1/4 Bend
Part No. PVC 304
• Used to turn pipe 90 degrees. Sometimes referred to as a long radius elbow.
  • H x H
PVC & ABS DWV Fittings For Non-Pressure Applications

The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

### PVC & ABS DWV Fittings

#### Long Sweep 1/4 Bend, Street
Part No. PVC 309
- Used to turn the pipe 90 degrees. Sometimes referred to as a long radius elbow. One end is spigot and the other end is hub.
- H x SPG

#### 1/6 Bend
Part No. PVC 319
- Used to turn the pipe 60 degrees.
- H x H

#### 1/6 Bend, Street
Part No. PVC 320
- Used to turn the pipe 60 degrees. One end is spigot and the other end is hub.
- H x SPG

#### 1/8 Bend, Street
Part No. PVC 323
- Used to turn the pipe 45 degrees.
- One end is spigot and the other end is hub.
- SPG x H

#### 1/16 Bend
Part No. PVC 326
- Used to turn the pipe 22 1/2 degrees; also called a 22 1/2 degree Elbow.
- H x H

#### Double 1/4 Bend
Part No. PVC 327
- Used to turn two branching lines 90 degrees and to connect them to a main line.
- H x H x H

#### Double Sanitary Tee
Part No. PVC 428
- Used to connect lines together.
- All Hub
PVC & ABS DWV Fittings For Non-Pressure Applications

The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

- **Double Fixture Fitting**
  - Part No. PVC 500
  - Used to branch line to two plumbing fixtures.
  - All Hub

- **Combination Wye and 1/8 Bend (One Piece)**
  - Part No. PVC 501
  - Used to connect a plumbing fixture to a drain line.
  - All Hub

- **Wye**
  - Part No. PVC 600
  - Used to branch a drain line at a 45 degree angle.
  - All Hub

- **Cleanout Tee w/ Cleanout Plug**
  - Part No. PVC 444X
  - Used to provide access to drain lines.
  - H x H x FPT

- **Two-Way Cleanout**
  - Part No. PVC 448
  - Used to provide above-ground access to vertical piping.
  - All Hub

- **Tail Piece Adapter w/ Plastic Nut and Packing Ring**
  - Part No. PVC 704P
  - Used to connect the P-Trap to the drain line.
  - SPG x Slip w/ Plastic Nut

- **P-Trap**
  - Part No. PVC 706X
  - Used to prevent sewer gas from entering the building/room.
  - H x H

- **Closet Flange w/ Knockout**
  - Part No. PVC 800K
  - Used to secure toilet bowl to the drain line/floor.
  - H
  - Available with and without knockout.
  - Available with metal or plastic ring.

- **Double Wye**
  - Part No. PVC 611
  - Used to branch two drain lines at 45 degree angles.
  - All Hub
ABS Cellular Core Schedule 40 DWV Pipe & ABS DWV Fittings For Non-Pressure Applications

**>> Description**
- Rigid pipe and fittings.
- Pipe and fittings are black in color.
- Joined with solvent cement conforming to ASTM D 2235.
- Fittings have a gradual sanitary turn.

**>> Application**
- Drain household sanitary waste (kitchen, bathroom).
- Sanitary sewer.
- Drain ground water.
- NOT for pressure applications.
- NOT for compressed air or gasses.

**>> Standards**
- ASTM F 628 Cellular Core ABS DWV Pipe
- ASTM D 2661 ABS DWV Fittings
- NSF Standard 14

**>> Dimensional Standard**
- Schedule 40 Iron Pipe Size (IPS)

**>> Cell Class**
- 42222 Cellular Core PVC DWV Pipe
- 32222 ABS DWV Fittings

**>> Maximum Working Temperature**
- 140° F
ABS Cellular Core Schedule 40 DWV Pipe & ABS DWV Fittings
For Non-Pressure Applications

>> Maximum Working Pressure
• 0 (zero) PSI
• ABS DWV is NOT a pressure-rated piping system.
• Recommended test is 10 feet of hydrostatic pressure, which equals 4.3 PSI.

>> Joining Method
Solvent Weld Joints
• Solvent cements must meet ASTM D 2235
• Primer is not recommended.
• May be joined with a slip joint compression fitting (trap adapter, for example).

Threaded Joints
• Threading ABS-40 Cellular pipe is NOT recommended.
• Male Iron Pipe size (MIP) and Female Iron Pipe size (FIP) adapters are available.
ABS Cellular Core Schedule 40 DWV Pipe & ABS DWV Fittings
For Non-Pressure Applications

>> Product Offering/Data

ASTM F 628 Cellular Core ABS DWV Pipe

<table>
<thead>
<tr>
<th>Size</th>
<th>OD</th>
<th>Nominal ID</th>
<th>Min Wall</th>
<th>Weight Per 100 ft. (lbs.)</th>
<th>Skid Quantity 10 ft. pcs/skid</th>
<th>Skid Quantity 20 ft. pcs/skid</th>
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<tr>
<td>1½&quot;</td>
<td>1.900</td>
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<td>3&quot;</td>
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<td>3.06</td>
<td>0.216</td>
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<td>4.00</td>
<td>0.237</td>
<td>107.1</td>
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<tr>
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<td>6.06</td>
<td>0.280</td>
<td>187.8</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Notices, Cautions and Warnings

Please refer to www.charlottepipe.com for all applicable notices, cautions and warnings for this product group. You may also contact us at (800) 438-6091 for additional safety, installation or application information.

Notices: N-2; N-3; N-6; N-7; N-9; N-11; N-12; N-13; N-15; N-19; N-22; N-27; N-35; N-37; N-38

Cautions: C-2, C-4, C-6

Warnings: W-2; W-3; W-4; W-5; W-6; W-9; W-10; W-12; W-13; W-14; W-18; W-21; W-22; W-23; W-24; W-26; W-28; W-29; W-30; W-31; W-35; W-37
Installation of PVC DWV & ABS DWV Pipe & Fittings Systems (1 1/4"–4" diameter)

**1. Cut Pipe**
Cut pipe square with axis.

**2. Remove Burrs & Bevel**
Remove burrs and bevel (chamfer) the end of the pipe 10°-15°.

**3. Clean and Dry Pipe and Fittings**
Remove surface dirt, grease or moisture with a clean, dry cloth.

**4. Dry Fit**
With light pressure, pipe should go one-half to one-third of the way into the fitting hub. Do not use pipe and fittings that are too tight or too loose.

**5. Applicator**
Use an applicator that is one-half the size of the pipe’s diameter.

**6. Coat With Primer and Cement**
Only use primer on PVC. Primer is not recommended on ABS. Apply a full, even coat of cement on the outside diameter of the pipe and to the inside hub of the fitting, and again to the outside of the pipe.

**7. Join & Cure**
While the cement is fluid, insert the pipe into fitting hub, giving a quarter turn to ensure an even distribution of cement within the joint. Allow the joint to cure prior to hydrostatic testing. See the solvent cement manufacturer’s recommendations.
PVC Schedule 40 DWV Pipe & PVC DWV Fittings For Non-Pressure Applications

>> Cure Times
Minimum Cure Time to Test

<table>
<thead>
<tr>
<th>Size</th>
<th>60˚-100˚F</th>
<th>40˚-60˚F</th>
<th>0˚-40˚F</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/4” to 3”</td>
<td>2 Hours</td>
<td>4 Hours</td>
<td>16 Hours</td>
</tr>
<tr>
<td>4” to 8”</td>
<td>6 Hours</td>
<td>12 Hours</td>
<td>48 Hours</td>
</tr>
<tr>
<td>10” to 12”</td>
<td>24 Hours</td>
<td>40 Hours</td>
<td>8 Days</td>
</tr>
</tbody>
</table>

Cure times shown are sufficient to complete a hydrostatic test at 4.3 PSI with 60% humidity and cold water. Full cure may take significantly longer.

>> Special Considerations
- Do NOT air test.
- Teflon® tape should be used for 1-inch or smaller and paste-type, non-hardening thread sealant on 11/4 inch or larger.
- UV sensitivity.
- Do NOT install permanently in direct sunlight without painting with water-based latex paint or covering with insulation.
- Support every 4 feet.

Cure times are a function of air temperature, water temperature, humidity and pipe size. Increase the cure time for more demanding conditions.

Notices, Cautions and Warnings
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Notices: N-2; N-3; N-6; N-7; N-9; N-11; N-12; N-13; N-15; N-19; N-22; N-27; N-35; N-37; N-38
Cautions: C-2, C-4, C-6
Warnings: W-2; W-3; W-4; W-5; W-6; W-9; W-10; W-12; W-13; W-14; W-18; W-21; W-22; W-23; W-24; W-26; W-28; W-29; W-30; W-31; W-35; W-37
ABS Cellular Core Schedule 40 DWV Pipe & ABS DWV Fittings
For Non-Pressure Applications

>> Cure Times

Minimum Cure Time to Test

<table>
<thead>
<tr>
<th>Size</th>
<th>60˚-100˚F</th>
<th>40˚-60˚F</th>
<th>0˚-40˚F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1½” to 3”</td>
<td>2 Hours</td>
<td>4 Hours</td>
<td>16 Hours</td>
</tr>
<tr>
<td>4” &amp; 6”</td>
<td>6 Hours</td>
<td>12 Hours</td>
<td>48 Hours</td>
</tr>
</tbody>
</table>

Cure times shown are sufficient to complete a hydrostatic test at 4.3 PSI with 60% humidity and cold water. Full cure may take significantly longer.

Cure times are a function of air temperature, water temperature, humidity and pipe size. Increase the cure time for more demanding conditions. For more specific information, contact the cement manufacturer.

>> Special Considerations

- Do NOT air test.
- Teflon® tape should be used for 1-inch or smaller and paste-type, non-hardening thread sealant on 1¾ inch or larger.
- UV sensitivity.
- Do NOT install permanently in direct sunlight without painting with water-based latex paint, or covering with insulation.
- Support every 4 feet.
Materials for Pressurized Systems

PVC Schedule 40 Pipe and Fittings
- Check pipe label for pressure rating.*
- White in color.
- Use correct primer and cement.

FlowGuard Gold® CPVC CTS Pipe and Fittings
- Use for hot and cold water.
- Manufactured from chlorinated polyvinyl chloride.
- Cream or tan in color.
- Sized the same as copper.

PVC Schedule 80 Pipe and Fittings
- Dark gray in color.
- Thicker wall allows it to withstand higher pressure (PSI).
- Use correct primer and cement.

*Consult the Charlotte Pipe Plastics Technical Manual for Pressure Ratings.
PVC Schedule 40 Pipe & Fittings
For Pressure Applications

>> Description
• Rigid pipe and fittings.
• Pipe and fittings are white in color.
• Joined with solvent cement conforming to ASTM D 2564.
• PVC Schedule 40 pressure fittings must be used. Pressure fittings will have straight angular turns.
• Do NOT use fittings with gradual sanitary turns for pressure systems.

>> Application
• Distribute potable (drinking) water under pressure up to a building. Never use inside.
• Irrigation/sprinkler systems.
• Drain condensate waste from heating and air conditioning systems.
• NOT for compressed air or gasses.

>> Standards
• ASTM D 1785 Plain End Pipe thru 16"
• ASTM D 2665 1¼"–12" Dual Marked Pipe
• ASTM D 2466 Fittings
• NSF Standard 14
• NSF Standard 61 Health Effects

>> Dimensional Standard
• Schedule 40 Iron Pipe Size (IPS)
### PVC Iron Pipe Size (IPS) Schedule Pipe

> Size goes up ↑ — Pressure rating goes down ↓

<table>
<thead>
<tr>
<th>Size</th>
<th>PVC Schedule 40 Max Work PSI</th>
<th>PVC Schedule 80 Max Work PSI</th>
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</thead>
<tbody>
<tr>
<td>1/2&quot;</td>
<td>600</td>
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<td>1&quot;</td>
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<td>630</td>
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<tr>
<td>8&quot;</td>
<td>160</td>
<td>250</td>
</tr>
</tbody>
</table>
# PVC Standard Dimension Ratio (SDR) Pipe

Defines a constant ratio between outside diameter and wall thickness.

All diameters within a specific Standard Dimension Ratio have same pressure rating.

Lower number = thicker wall.

Also referred to as “Class” or “PR”.


<table>
<thead>
<tr>
<th>Part Number</th>
<th>Nom. Size</th>
<th>SDR</th>
<th>Max Working PSI 73° F (23° C)</th>
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<tr>
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<td>½&quot; x 20'</td>
<td>13.5</td>
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<tr>
<td>PVC 20007B</td>
<td>¾&quot; x 10'</td>
<td>21</td>
<td>200</td>
</tr>
<tr>
<td>PVC 20007B</td>
<td>¾&quot; x 20'</td>
<td>21</td>
<td>200</td>
</tr>
<tr>
<td>PVC 20010B</td>
<td>1&quot; x 20'</td>
<td>21</td>
<td>200</td>
</tr>
<tr>
<td>PVC 20012B</td>
<td>1¼&quot; x 20'</td>
<td>21</td>
<td>200</td>
</tr>
<tr>
<td>PVC 20015B</td>
<td>1½&quot; x 20'</td>
<td>21</td>
<td>200</td>
</tr>
<tr>
<td>PVC 20020B</td>
<td>2&quot; x 20'</td>
<td>21</td>
<td>200</td>
</tr>
<tr>
<td>PVC 20025B</td>
<td>2½&quot; x 20'</td>
<td>21</td>
<td>200</td>
</tr>
<tr>
<td>PVC 20030B</td>
<td>3&quot; x 20'</td>
<td>21</td>
<td>200</td>
</tr>
<tr>
<td>PVC 20040B</td>
<td>4&quot; x 20'</td>
<td>21</td>
<td>200</td>
</tr>
<tr>
<td>PVC 20060B</td>
<td>6&quot; x 20'</td>
<td>21</td>
<td>200</td>
</tr>
<tr>
<td>PVC 16012B</td>
<td>1¼&quot; x 20'</td>
<td>26</td>
<td>160</td>
</tr>
<tr>
<td>PVC 16015B</td>
<td>1½&quot; x 20'</td>
<td>26</td>
<td>160</td>
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<tr>
<td>PVC 16020B</td>
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<td>26</td>
<td>160</td>
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<td>PVC 16025B</td>
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<td>PVC 16030B</td>
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<td>160</td>
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<tr>
<td>PVC 16040B</td>
<td>4&quot; x 20'</td>
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<td>160</td>
</tr>
<tr>
<td>PVC 16060B</td>
<td>6&quot; x 20'</td>
<td>26</td>
<td>160</td>
</tr>
</tbody>
</table>
PVC Schedule 40 Pipe & Fittings For Pressure Applications

>> Cell Class/Material Code
- Cell Class: 12454 (Type 1)
- Material Code: PVC 1120

>> Maximum Working Temperature
- 140°F
- For special applications, threaded connections, unions and flanges. A temperature de-rating factor must be used to determine the pressure rating at temperatures hotter than 73°F.
Please visit www.charlottepipe.com for additional information.

>> Maximum Working Pressure
See Product Offering/Data chart on page 23.

>> Joining Method
Solvent Weld Joints
- Solvent cements must meet ASTM D 2564.
- Primer is required.
- May be flanged with Schedule 80 flanges.
- Threading PVC 40 pipe is NOT recommended.
- Male Iron Pipe size (MIP) and Female Iron Pipe size (FIP) adapters are available.
## PVC Schedule 40 Pipe & Fittings For Pressure Applications

### Product Offering/Data

**ASTM D 1785 Solid Wall Plain End PVC Pipe**

<table>
<thead>
<tr>
<th>Size</th>
<th>OD</th>
<th>Nominal ID</th>
<th>Min Wall</th>
<th>Weight Per 100 ft. (lbs.)</th>
<th>Max Work PSI 73˚F (23˚C)</th>
<th>Skid Quantity 10 ft. pcs/skid</th>
<th>Skid Quantity 20 ft. pcs/skid</th>
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<tr>
<td>1/4&quot;</td>
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</tbody>
</table>

*Dual marked ASTM D 1785 and ASTM D 2665*
## PVC Schedule 40 Pressure Ratings

<table>
<thead>
<tr>
<th>Size</th>
<th>Pressure Rating (psi) @ 73°F</th>
<th></th>
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<th>Pressure Rating (psi) @ 140°F</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Pipe</td>
<td>Fittings</td>
<td>Threaded</td>
<td>Fittings</td>
<td>Flanges</td>
<td>Unions</td>
<td>Pipe</td>
<td>Fittings</td>
<td>Threaded</td>
<td>Flanges</td>
</tr>
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<td>150</td>
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</tr>
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<td>130</td>
<td>78</td>
<td>65</td>
<td>-</td>
<td>-</td>
<td>29</td>
<td>17</td>
<td>14</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>16&quot;</td>
<td>130</td>
<td>78</td>
<td>65</td>
<td>-</td>
<td>-</td>
<td>29</td>
<td>17</td>
<td>14</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
PVC Schedule 40 Fittings For Pressure Applications

The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

**Coupling**
Part No. PVC 2100
- Used to join two pipes together; extend pipe.
- S x S

**Reducer Coupling**
Part No. PVC 2100
- Used to transition from a larger diameter pipe to a smaller one.
- S x S

**Female Adapter**
Part No. PVC 2101
- Used to join a male threaded fitting on one side and PVC on the other.
- S x FPT

**Coupling**
Part No. PVC 2102
- Used to join two pipes together; extend pipe.
- FPT x FPT

**Riser Extension**
Part No. PVC 2103
- Used to join two pipes together; extend pipe.
- FPT x MPT

**Reducer Bushing (Flush Style)**
Part No. PVC 2108
- Used to join a male threaded fitting to a pipe or fitting of a different diameter.
- (SPG x FPT), (MPT x FPT)

**Male Adapter**
Part No. PVC 2109
- Used to join a female threaded fitting.
- MPT x S

**Reducer Bushing (Flush Style)**
Part No. PVC 2107
- Used to join pipes of different diameters.
- SPG x S
PVC Schedule 40 Fittings For Pressure Applications

The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

- **Plug**
  - Part No. PVC 2113
  - Used to seal off pipe, fittings and cleanouts.
  - MPT

- **Plug**
  - Part No. PVC 2118
  - Used to seal off pipe, fittings and cleanouts.
  - SPG

- **Cap**
  - Part No. PVC 2116
  - Used to seal off end of pipe.
  - S

- **Cap**
  - Part No. PVC 2117
  - Used to seal off end of pipe.
  - FPT

- **90° Elbow**
  - Part No. PVC 2300
  - Used to turn the pipe 90 degrees; also called a 1/4 bend.
  - S x S

- **90° Street Elbow**
  - Part No. PVC 2307
  - Used to connect two different size pipes at a 90 degree turn.
  - (S x S), (S x FPT)

- **90° Elbow**
  - Part No. PVC 2301
  - Used to turn the pipe 90 degrees; also called a 1/4 bend.
  - (FPT x S), (FPT x FPT)

- **90° Street Elbow**
  - Part No. PVC 2304
  - Used to turn the pipe 90 degrees; also called a 1/4 bend.
  - (SPG x S), (MPT x S), (MPT x FPT)
PVC Schedule 40 Fittings For Pressure Applications
The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

45° Elbow
Part No. PVC 2309
• Used to turn the pipe 45 degrees; also called a ¼ bend.
• S x S

Tee
Part No. PVC 2400
• Used to connect three lines together or to branch off the main line.
• S x S x S

Reducing Tee
Part No. PVC 2401
• Used to connect one to three different size pipes together.
• S x S x FPT

Cross
Part No. PVC 2410
• Used to connect multiple pipes together.
• S x S x S x S

Side Outlet Elbow
Part No. PVC 2520
• Used to connect a male threaded fitting and two lines in a 90 degree turn.
• S x S x FPT

HVAC Condensate Traps* (Non-Pressure)

Condensate P Trap
Part No. PVC 2700
• Used to protect HVAC condensers and condensate from contaminants.
• SPG x SPG

Condensate Running Trap
Part No. PVC 2701
• Used to protect HVAC condensers and condensate from contaminants.
• SPG x SPG

*Condensate traps do not conform to ASTM D 2466.
Installation of PVC Schedule 40 Pressure Pipe & Fittings Systems (1/2"–4" diameter)

<table>
<thead>
<tr>
<th>1</th>
<th>CUT PIPE</th>
<th>Cut pipe square with axis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>REMOVE BURRS &amp; BEVEL</td>
<td>Remove burrs and bevel (chamfer) the end of the pipe 10°-15°.</td>
</tr>
<tr>
<td>3</td>
<td>CLEAN AND DRY PIPE AND FITTINGS</td>
<td>Remove surface dirt, grease or moisture with a clean, dry cloth.</td>
</tr>
<tr>
<td>4</td>
<td>DRY FIT</td>
<td>With light pressure, pipe should go one-half to one-third of the way into the fitting hub. Do not use pipe and fittings that are too tight or too loose.</td>
</tr>
<tr>
<td>5</td>
<td>APPLICATOR</td>
<td>Use an applicator that is one-half the size of the pipe's diameter.</td>
</tr>
<tr>
<td>6</td>
<td>COAT WITH PRIMER AND CEMENT</td>
<td>Only use primer on PVC. Primer is not recommended on ABS. Apply a full, even coat of cement on the outside diameter of the pipe and to the inside hub of the fitting, and again to the outside of the pipe.</td>
</tr>
<tr>
<td>7</td>
<td>JOIN &amp; CURE</td>
<td>While the cement is fluid, insert the pipe into fitting hub, giving a quarter turn to ensure an even distribution of cement within the joint. Allow the joint to cure prior to hydrostatic testing. See the solvent cement manufacturer's recommendations.</td>
</tr>
</tbody>
</table>
Cure times are a function of air temperature, water temperature, humidity and pipe size. Increase the cure time for more demanding conditions. For more specific information, contact the cement manufacturer.

**Cure Times**

**Minimum Cure Time to Test at 180 PSI**

<table>
<thead>
<tr>
<th>Size</th>
<th>60˚-100˚F</th>
<th>40˚-60˚F</th>
<th>0˚-40˚F</th>
</tr>
</thead>
<tbody>
<tr>
<td>½&quot; to 1½&quot;&quot;</td>
<td>1 Hour</td>
<td>2 Hours</td>
<td>8 Hours</td>
</tr>
<tr>
<td>1½&quot; to 3&quot;&quot;</td>
<td>2 Hours</td>
<td>4 Hours</td>
<td>16 Hours</td>
</tr>
<tr>
<td>4&quot; to 8&quot;&quot;</td>
<td>6 Hours</td>
<td>12 Hours</td>
<td>48 Hours</td>
</tr>
<tr>
<td>10&quot; to 16&quot;</td>
<td>24 Hours</td>
<td>48 Hours</td>
<td>8 Days</td>
</tr>
</tbody>
</table>

Cure times shown are sufficient to complete a hydrostatic test at 100 PSI with 60% humidity and cold water. Full cure may take significantly longer.

**Special Considerations**

- Do NOT air test.
- UV sensitivity.
- Do NOT install permanently in direct sunlight without painting with water-based latex paint, or covering with insulation.
- Teflon® tape should be used for 1-inch or smaller and paste-type, non-hardening thread sealant on 1½ inch or larger.

**Notices, Cautions and Warnings** Please refer to www.charlottepipe.com for all applicable notices, cautions and warnings for this product group. You may also contact us at (800) 438-6091 for additional safety, installation or application information.

Notices: N-2; N-3; N-4; N-5; N-6; N-7; N-8; N-9; N-10; N-11; N-12; N-14; N-15; N-17; N-19; N-22; N-27; N-32; N-34; N-38
Cautions: C-2, C-4, C-6, C-8
Warnings: W-2; W-3; W-4; W-5; W-6; W-9; W-12; W-13; W-14; W-15; W-17; W-18; W-21; W-22; W-23; W-24; W-26; W-28; W-29; W-35; W-37
FlowGuard Gold® CPVC Copper Tube Size (CTS)

The contractor’s choice for hot and cold domestic water piping applications

>> CPVC CTS has been used for hot and cold domestic water applications for decades.
>> CPVC CTS piping systems conform to NSF International Standard 61, ensuring the safety of products that come into contact with drinking water.

FlowGuard Gold Advantages

>> Corrosion resistance. FlowGuard Gold is not attacked by aggressive water that may destroy copper pipe.
>> Chlorine resistance. FlowGuard Gold is not degraded by chlorinated water that may damage PEX pipe.
>> Healthy water. FlowGuard Gold compounds meet the stringent safety requirements of ANSI/NSF (National Sanitation Foundation) Standard 61, so you know that we are meeting the highest purity standard for the industry.
>> FlowGuard Gold is made from a specially compounded formula, ensuring high impact resistance even at low temperatures.
FlowGuard Gold® CPVC Copper Tube Size (CTS) Pipe & Fittings For Pressurized Hot & Cold Water Applications

**Description**
- Rigid pipe and fittings.
- Pipe and fittings are cream or tan in color with the pipe having a gold stripe.
- Joined with solvent cement conforming to ASTM F 493.

**Application**
- Distribute hot and cold potable (drinking) water under pressure.
- NOT for compressed air or gasses.

**Standards**
- ASTM D 2846 Pipe & Fittings
- ASTM F 493 Solvent Cement
- NSF Standard 14
- NSF Standard 61 Health Effects
- CSA 137.6-M Canadian Standard

**Dimensional Standard**
- SDR 11 Copper Tube Size (CTS) Outside Diameter (OD)

**Cell Class/Material Code**
- Cell Class: 24448 (Type IV)
- Material Code: CPVC 4120
FlowGuard Gold® CPVC Copper Tube Size (CTS) Pipe & Fittings
For Pressurized Hot & Cold Water Applications

>> Maximum Working Temperature
• 180° F (82° C)

>> Maximum Working Pressure
• 400 PSI at 73° F
• 100 PSI at 180° F

>> Joining Method
Solvent Weld Joints
• Solvent cements must meet ASTM F 493.
• Yellow FlowGuard Gold cements may be used without primer, where approved by code.
• Compression fittings with a brass ferrule may be used.

Threaded Joints
• Threading the pipe is NOT recommended
• Use CPVC CTS male adapters in cold water applications only.
• Use CPVC CTS x brass threaded transition fittings for hot water applications.
• Do NOT use compression fittings with brass ferrules to connect to CPVC CTS pipe or fittings where water temperatures will exceed 140° F.
• CPVC CTS pipe can be used with standard brass ferrules to make compression connections where the operating temperature will NOT exceed 140° F. Apply Teflon (PTFE) tape over the ferrule to allow for the dissimilar thermal expansion and contraction characteristics of the metal ferrule and the plastic pipe.
FlowGuard Gold® CPVC Copper Tube Size (CTS) Pipe & Fittings
For Pressurized Hot & Cold Water Applications

>> Temperature De-rating Factor

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Pressure Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>73°F</td>
<td>400 PSI</td>
</tr>
<tr>
<td>80°F</td>
<td>400 PSI</td>
</tr>
<tr>
<td>90°F</td>
<td>360 PSI</td>
</tr>
<tr>
<td>100°F</td>
<td>325 PSI</td>
</tr>
<tr>
<td>120°F</td>
<td>260 PSI</td>
</tr>
<tr>
<td>140°F</td>
<td>200 PSI</td>
</tr>
<tr>
<td>160°F</td>
<td>160 PSI</td>
</tr>
<tr>
<td>180°F</td>
<td>100 PSI</td>
</tr>
</tbody>
</table>

>> Special Considerations

- Do NOT air test.
- See current chemical compatibility sheet in product packaging or visit www.charlottepipe.com for additional information.
- Teflon® tape should be used for 1-inch or smaller and paste-type, non-hardening thread sealant on 1 3/4 inch or larger.
- UV sensitivity.
- Do NOT install permanently in direct sunlight without painting with water-based latex paint, or covering with insulation.
FlowGuard Gold® CPVC Copper Tube Size (CTS) CPVC
For Pressurized Hot & Cold Potable Water Applications

## Product Offering/Data

**FlowGuard Gold Copper Tube Size (CTS) CPVC**

<table>
<thead>
<tr>
<th>Size</th>
<th>Average OD</th>
<th>Nominal ID</th>
<th>Min Wall</th>
<th>Weight Per 100 ft. (lbs.)</th>
<th>Max Work PSI</th>
<th>73° F 23° C</th>
<th>180° F 82° C</th>
<th>Skid Quantity 10 ft. pcs/skid</th>
<th>Skid Quantity 20 ft. pcs/skid</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2&quot;</td>
<td>0.625</td>
<td>0.485</td>
<td>0.068</td>
<td>8.3</td>
<td>400</td>
<td>400</td>
<td>100</td>
<td>1200</td>
<td>1200</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>0.875</td>
<td>0.713</td>
<td>0.080</td>
<td>13.9</td>
<td>400</td>
<td>400</td>
<td>100</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>1&quot;</td>
<td>1.125</td>
<td>0.921</td>
<td>0.102</td>
<td>22.2</td>
<td>400</td>
<td>400</td>
<td>100</td>
<td>360</td>
<td>360</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>1.375</td>
<td>1.125</td>
<td>0.125</td>
<td>33.3</td>
<td>400</td>
<td>400</td>
<td>100</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>1.625</td>
<td>1.329</td>
<td>0.148</td>
<td>46.6</td>
<td>400</td>
<td>400</td>
<td>100</td>
<td>144</td>
<td>144</td>
</tr>
<tr>
<td>2&quot;</td>
<td>2.125</td>
<td>1.739</td>
<td>0.193</td>
<td>79.5</td>
<td>400</td>
<td>400</td>
<td>100</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

**Notices, Cautions and Warnings**

Please refer to www.charlottetube.com for all applicable notices, cautions and warnings for this product group. You may also contact us at (800) 438-6091 for additional safety, installation or application information.

**Notices:** N-2; N-3; N-4; N-5; N-6; N-7; N-8; N-9; N-10; N-11; N-12; N-14; N-15; N-17; N-19; N-22; N-27; N-32; N-34; N-38

**Cautions:** C-2, C-4, C-6, C-8

**Warnings:** W-2; W-3; W-4; W-5; W-6; W-9; W-12; W-13; W-14; W-15; W-17; W-18; W-21; W-22; W-23; W-24; W-26; W-28; W-29; W-35; W-37
FlowGuard Gold® CPVC Copper Tube Size (CTS) Fittings

The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

**Coupling**
Part No. CTS 2100
- Used to join two pipes together; extend pipe.
- \( S \times S \)

**Transition Coupling**
Part No. CTS 2100 L
- Used to transition from a larger diameter pipe to a smaller one.
- CTS Socket x Schedule 40 Socket

**Female Adapter, Brass Threads, Low Lead**
Part No. CTS 2105 L
- Used to join a metallic male threaded fitting on one side and CPVC on the other. Can be used for hot water applications.
- Brass FPT x CTS Socket

**Reducer Bushing**
Part No. CTS 2107
- Used to join pipes of different diameters.
- \( S \times SPG \)

**Transition Bushing**
Part No. CTS 2107 L
- Used to transition from Copper Tube Size (CTS) to Iron Pipe Size (IPS) systems.
- CTS Socket x IPS Spigot

**Male Adapter**
Part No. CTS 2109
- Used to join a female threaded fitting.
  For cold water applications only.
- MPT x ALL-CPVC Socket
FlowGuard Gold® CPVC Copper Tube Size (CTS) Fittings

The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

**Male Adapter, Reducing**
Part No. CTS 2110
- Used to join a female threaded fitting of a different diameter to CPVC on the other end.
  For cold water applications only.
- ALL-CPVC Socket x MPT

**Male Adapter, Street**
Part No. CTS 2111
- Used to join a female threaded fitting and CPVC on the other end. For cold water applications only.
- MPT x CPVC Spigot

**Male Adapter, Brass Threads, Low Lead**
Part No. CTS 2115 L
- Used to join a metallic female threaded fitting on one side and CPVC on the other. Can be used for hot water applications.
- Brass MPT x CTS Socket

**Cap**
Part No. CTS 2116
- Used to seal off end of pipe.
- S

**90° Elbow**
Part No. CTS 2300
- Used to turn the pipe 90 degrees; also called a ¼ bend.
- S x S

**Drop Ear Elbow**
Part No. CTS 2300 D
- Used to turn the pipe 90 degrees. Intended to be secured to wall framing.
- ALL-CPVC Socket x Socket
FlowGuard Gold® CPVC Copper Tube Size (CTS) Fittings

The following is a partial listing of Charlotte Pipe and Foundry's product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

**CPVC/Brass Drop Ear 90˚ Elbow, Brass Threads, Low Lead**
Part No. CTS 2302 L
- Used to turn the pipe 90 degrees. Intended to be secured to wall framing. Can be used for hot water applications.
- Brass FPT x CPVC Socket

**90˚ Street Elbow**
Part No. CTS 2304
- Used to turn pipe 90 degrees.
- SPG x S

**45˚ Elbow**
Part No. CTS 2309
- Used to turn the pipe 45 degrees.
- S x S

**45˚ Street Elbow**
Part No. CTS 2310
- Used to turn the pipe 45 degrees. One end is spigot and the other end is hub.
- SPG x S

**Tee**
Part No. CTS 2400
- Used to connect three lines together or to branch off the main line.
- S x S x S

**Reducing Tee**
Part No. CTS 2400
- Used to connect one to three different size pipes together.
- S x S x S
Installation of FlowGuard Gold® CPVC Copper Tube Size (CTS) Pipe & Fittings Systems

1. **CUT PIPE**
   - Cut pipe square with axis.

2. **REMOVE BURRS & BEVEL**
   - Remove burrs and bevel (chamfer) the end of the pipe 10°-15°.

3. **CLEAN AND DRY PIPE AND FITTINGS**
   - Remove surface dirt, grease or moisture with a clean, dry cloth.

4. **DRY FIT**
   - With light pressure, pipe should go one-half to one-third of the way into the fitting hub. Do not use pipe and fittings that are too tight or too loose.

5. **APPLICATOR**
   - Use an applicator that is one-half the size of the pipe’s diameter.

6. **COAT WITH CEMENT**
   - Primer is not necessary for CTS, however, check with your local plumbing codes. Apply a full, even coat of cement on the outside diameter of the pipe and to the inside hub of the fitting, and again coat the outside of the pipe.

7. **JOIN & CURE**
   - While the cement is fluid, insert the pipe into fitting hub, giving a quarter turn to ensure an even distribution of cement within the joint. Allow the joint to cure prior to hydrostatic testing. See the solvent cement manufacturer’s recommendations.
FlowGuard Gold® CPVC Copper Tube Size (CTS) Pipe & Fittings
For Pressurized Hot & Cold Water Applications

**Cure Times**

Minimum Cure Time to Test at 100 PSI

<table>
<thead>
<tr>
<th>Size</th>
<th>60° F</th>
<th>40° F</th>
<th>32° F</th>
<th>0° F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2&quot;</td>
<td>10 min.</td>
<td>10 min.</td>
<td>15 min.</td>
<td>30 min.</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>10 min.</td>
<td>15 min.</td>
<td>15 min.</td>
<td>30 min.</td>
</tr>
<tr>
<td>1&quot;</td>
<td>10 min.</td>
<td>15 min.</td>
<td>20 min.</td>
<td>30 min.</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>10 min.</td>
<td>15 min.</td>
<td>20 min.</td>
<td>30 min.</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>15 min.</td>
<td>15 min.</td>
<td>30 min.</td>
<td>45 min.</td>
</tr>
<tr>
<td>2&quot;</td>
<td>15 min.</td>
<td>15 min.</td>
<td>30 min.</td>
<td>60 min.</td>
</tr>
</tbody>
</table>

Cure times shown are sufficient to complete a hydrostatic test at 100 PSI with 60% humidity and cold water. Full cure may take significantly longer.

Cure times are a function of air temperature, water temperature, humidity and pipe size. Increase the cure time for colder temperatures or higher humidity.
Special Considerations

**Pipe Threads**
- Use Teflon® tape thread sealant for threaded connections 1 inch or smaller. Use a paste-type non-hardening thread sealant for threaded connections 1 1/4 inch or larger.
- Do NOT use CPVC plastic threaded male adapters on hot water lines or when connecting to water heaters. Special brass threaded male adapters are available and recommended.
- Do NOT use CPVC plastic threaded female adapters. Special brass threaded female adapters are available and recommended.

**WARNING**
Testing with or use of compressed air or gas in PVC / ABS / CPVC pipe or fittings can result in explosive failures and cause severe injury or death.
- NEVER test with or transport/store compressed air or gas in PVC / ABS / CPVC pipe or fittings.
- NEVER test PVC / ABS / CPVC pipe or fittings with compressed air or gas, or air over water boosters.
- ONLY use PVC / ABS / CPVC pipe or fittings for water or approved chemicals.
- Refer to warnings on PPFA’s website and ASTM D 1785.
PVC Schedule 80 Pipe & Fittings
For Pressure Applications

>> Description
• Rigid pipe and fittings.
• Pipe and fittings are dark gray in color.
• Joined with solvent cement conforming to ASTM D 2564.
• PVC Schedule 80 pressure fittings with straight, angular turns must be used.
• Do NOT use DWV fittings with gradual sanitary turns in pressure systems.

>> Application
• Distribution of pressurized liquids.
• Can be used in industrial applications.
  See Charlotte Pipe’s Chemical Compatibility Chart for more information.
• NOT for compressed air or gasses.

>> Standards
• ASTM D 1785 Plain End Pipe thru 16”
• ASTM D 2467 and ASTM D 2464 Fittings
• NSF Standard 14
• NSF Standard 61 Health Effects

>> Dimensional Standard
• Schedule 80 Iron Pipe Size (IPS)
PVC Schedule 80 Pipe & Fittings For Pressure Applications

>> **Cell Class/Material Code**
   - Cell Class: 12454 (Type 1)
   - Material Code: PVC 1120

>> **Maximum Working Temperature**
   - 140° F
   - For special applications, threaded connections, unions and flanges, a temperature de-rating factor must be used to determine the pressure rating at temperatures hotter than 73° F.
   Please visit [www.charlottepipe.com](http://www.charlottepipe.com) for additional information.

>> **Maximum Working Pressure**
   See Product Offering/Data chart on page 47.

>> **Joining Method**
   **Solvent Weld Joints**
   - Solvent cements must meet ASTM D 2564.
   - Primer should be IPS P-70 or Oatey Industrial Grade.
   - May be flanged with Schedule 80 flanges.
   - Threading PVC 80 pipe can be done.
   Please visit [www.charlottepipe.com](http://www.charlottepipe.com) for additional information.
   - Male Iron Pipe size (MIP) and Female Iron Pipe size (FIP) adapters are available.
## PVC Schedule 80 Pressure Ratings

<table>
<thead>
<tr>
<th>Size</th>
<th>Pressure Rating (psi) @ 73°F</th>
<th>Pressure Rating (psi) @ 140°F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pipe</td>
<td>Socket Fittings</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>850</td>
<td>510</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>690</td>
<td>414</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>630</td>
<td>378</td>
</tr>
<tr>
<td>5/8&quot;</td>
<td>520</td>
<td>312</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>470</td>
<td>282</td>
</tr>
<tr>
<td>1&quot;</td>
<td>400</td>
<td>240</td>
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<tr>
<td>1 1/4&quot;</td>
<td>420</td>
<td>252</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>370</td>
<td>222</td>
</tr>
<tr>
<td>2&quot;</td>
<td>320</td>
<td>192</td>
</tr>
<tr>
<td>2 1/4&quot;</td>
<td>290</td>
<td>174</td>
</tr>
<tr>
<td>3&quot;</td>
<td>280</td>
<td>168</td>
</tr>
<tr>
<td>4&quot;</td>
<td>250</td>
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<td>230</td>
<td>138</td>
</tr>
<tr>
<td>8&quot;</td>
<td>220</td>
<td>132</td>
</tr>
<tr>
<td>10&quot;</td>
<td>220</td>
<td>132</td>
</tr>
<tr>
<td>12&quot;</td>
<td></td>
<td>132</td>
</tr>
<tr>
<td>14&quot;</td>
<td></td>
<td>132</td>
</tr>
<tr>
<td>16&quot;</td>
<td></td>
<td>132</td>
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PVC Schedule 80 Pipe & Fittings For Pressure Applications

<table>
<thead>
<tr>
<th>Size</th>
<th>OD</th>
<th>Wall</th>
<th>Weight Per 100 ft. (lbs.)</th>
<th>Max Work PSI 73˚ F (23˚ C)</th>
<th>Skid Quantity 10 ft. pcs/skid</th>
<th>Skid Quantity 20 ft. pcs/skid</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2&quot;</td>
<td>0.840</td>
<td>0.147</td>
<td>20.3</td>
<td>850</td>
<td>600</td>
<td>344</td>
</tr>
<tr>
<td>¾&quot;</td>
<td>1.050</td>
<td>0.154</td>
<td>27.5</td>
<td>690</td>
<td>400</td>
<td>210</td>
</tr>
<tr>
<td>1&quot;</td>
<td>1.315</td>
<td>0.179</td>
<td>40.5</td>
<td>630</td>
<td>260</td>
<td>177</td>
</tr>
<tr>
<td>1¼&quot;</td>
<td>1.660</td>
<td>0.191</td>
<td>55.9</td>
<td>520</td>
<td>250</td>
<td>212</td>
</tr>
<tr>
<td>1½&quot;</td>
<td>1.900</td>
<td>0.200</td>
<td>67.7</td>
<td>470</td>
<td>—</td>
<td>165</td>
</tr>
<tr>
<td>2&quot;</td>
<td>2.375</td>
<td>0.218</td>
<td>93.6</td>
<td>400</td>
<td>—</td>
<td>111</td>
</tr>
<tr>
<td>3&quot;</td>
<td>3.500</td>
<td>0.300</td>
<td>194.2</td>
<td>370</td>
<td>—</td>
<td>48</td>
</tr>
<tr>
<td>4&quot;</td>
<td>4.500</td>
<td>0.337</td>
<td>279.3</td>
<td>320</td>
<td>—</td>
<td>57</td>
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<tr>
<td>6&quot;</td>
<td>6.625</td>
<td>0.432</td>
<td>532.7</td>
<td>280</td>
<td>—</td>
<td>26</td>
</tr>
</tbody>
</table>
PVC Schedule 80 Fittings For Pressure Applications

The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

**Tee**
Part No. PVC 8400
- Used to connect three lines together or to branch off the main line.
  - S x S x S

**Reducing Tee**
Part No. PVC 8400
- Used to connect one to three different size pipes together.
  - S x S x S

**Tee**
Part No. PVC 8401
- Used to connect three lines together or to branch off the main line.
  - S x S x FPT

**Tee**
Part No. PVC 8402
- Used to connect three lines together or to branch off the main line.
  - FPT x FPT x FPT

**90° Elbow**
Part No. PVC 8300
- Used to turn the pipe 90 degrees; also called a ¼ bend.
  - S x S

**90° Elbow**
Part No. PVC 8301
- Used to turn the pipe 90 degrees; also called a ¼ bend.
  - S x FPT

**90° Elbow**
Part No. PVC 8302
- Used to turn the pipe 90 degrees; also called a ¼ bend.
  - FPT x FPT

**45° Elbow**
Part No. PVC 8309
- Used to turn the pipe 45 degrees; also called a ⅛ bend.
  - S x S
PVC Schedule 80 Fittings For Pressure Applications

The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

45˚ Elbow
Part No. PVC 8312
• Used to turn the pipe 45 degrees; also called a ⅛ bend.
  • FPT x FPT

Wye
Part No. PVC 8600
• Used to branch a drain line at a 45 degree angle.
  • S x S x S

Coupling
Part No. PVC 8100
• Used to join two pipes together; extend pipe.
  • S x S

Reducer Coupling
Part No. PVC 8100
• Used to transition from a larger diameter pipe to a smaller one.
  • S x S

Coupling
Part No. PVC 8102
• Used to join two pipes together; extend pipe.
  • FPT x FPT

Female Adapter
Part No. PVC 8101
• Used to join a male threaded fitting on one side and PVC on the other.
  • S x FPT

Male Adapter
Part No. PVC 8109
• Used to join a female threaded fitting.
  • S x MPT

Reducer Bushing [Flush Style]
Part No. PVC 8107
• Used to join pipes of different diameters.
  • SPG x S
**PVC Schedule 80 Fittings For Pressure Applications**

The following is a partial listing of Charlotte Pipe and Foundry's product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

### PVC Schedule 80 Fitting Patterns

<table>
<thead>
<tr>
<th>Fitting</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducer Bushing (Flush Style)</td>
<td>PVC 8108</td>
<td>Used to join a male threaded fitting to a pipe or fitting of a different diameter. SPG x FPT</td>
</tr>
<tr>
<td>Reducer Bushing (Flush Style)</td>
<td>PVC 8200</td>
<td>Used to join a male threaded fitting to a pipe or fitting of a different diameter. MPT x FPT</td>
</tr>
<tr>
<td>Cap</td>
<td>PVC 8116</td>
<td>Used to seal off end of pipe. S</td>
</tr>
<tr>
<td>Cap</td>
<td>PVC 8117</td>
<td>Used to seal off end of pipe. FPT</td>
</tr>
<tr>
<td>Plug</td>
<td>PVC 8113</td>
<td>Used to seal off pipe, fittings and cleanouts. MPT</td>
</tr>
<tr>
<td>Flange (One-Piece)</td>
<td>PVC 8500</td>
<td>Used with bolts to mechanically join pipe. S</td>
</tr>
<tr>
<td>Flange (One-Piece)</td>
<td>PVC 8560</td>
<td>Used with bolts to mechanically join pipe. FPT</td>
</tr>
<tr>
<td>Blind Flange</td>
<td>PVC 8510</td>
<td>Used to seal off the end of a pipe and stop the flow.</td>
</tr>
</tbody>
</table>
PVC Schedule 80 Fittings For Pressure Applications

The following is a partial listing of Charlotte Pipe and Foundry’s product offering. Please call (800) 438-6091 or visit www.charlottepipe.com for a complete list.

Van Stone Flange
Part No. PVC 8530
• Used with bolts to mechanically join pipe.
• S

Union with Viton® O-Ring Seal
Part No. PVC 8700
• Used to allow connection and disconnection of joints without disrupting other pipe sections.
• S x S

Union with Viton® O-Ring Seal
Part No. PVC 8800
• Used to allow connection and disconnection of joints without disrupting other pipe sections.
• FPT x FPT

Union with EPDM O-Ring Seal
Part No. PVC 8710
• Used to allow connection and disconnection of joints without disrupting other pipe sections.
• S x S

Union with EPDM O-Ring Seal
Part No. PVC 8810
• Used to allow connection and disconnection of joints without disrupting other pipe sections.
• FPT x FPT

Union with EPDM O-Ring Seal
Part No. PVC 8830
• Used to allow connection and disconnection of joints without disrupting other pipe sections.
• S x FPT
# Installation of PVC Schedule 80 Pipe & Fittings Systems

(1/4"–4" diameter)

1. **CUT PIPE**
   - Cut pipe square with axis.

2. **REMOVE BURRS & BEVEL**
   - Remove burrs and bevel (chamfer) the end of the pipe 10°-15°.

3. **CLEAN AND DRY PIPE AND FITTINGS**
   - Remove surface dirt, grease or moisture with a clean, dry cloth.

4. **DRY FIT**
   - With light pressure, pipe should go one-half to one-third of the way into the fitting hub. Do not use pipe and fittings that are too tight or too loose.

5. **APPLICATOR**
   - Use an applicator that is one-half the size of the pipe’s diameter.

6. **COAT WITH PRIMER AND CEMENT**
   - Only use primer on PVC. Primer is not recommended on ABS. Apply a full, even coat of cement on the outside diameter of the pipe and to the inside hub of the fitting, and again to the outside of the pipe.

7. **JOIN & CURE**
   - While the cement is fluid, insert the pipe into fitting hub, giving a quarter turn to ensure an even distribution of cement within the joint. Allow the joint to cure prior to hydrostatic testing. See the solvent cement manufacturer’s recommendations.
Cure times are a function of air temperature, water temperature, humidity and pipe size. Increase the cure time for more demanding conditions. For more specific information, contact the cement manufacturer.

**Special Considerations**
- Do NOT air test.
- UV sensitivity.
- Do NOT install permanently in direct sunlight without painting with water-based latex paint, or covering with insulation.
- Teflon® tape should be used for 1-inch or smaller and paste-type, non-hardening thread sealant on 1¼ inch or larger.

Notices, Cautions and Warnings Please refer to www.charlottepipe.com for all applicable notices, cautions and warnings for this product group. You may also contact us at (800) 438-6091 for additional safety, installation or application information.

**Notices:** N-2; N-3; N-4; N-5; N-6; N-7; N-8; N-9; N-10; N-11; N-12; N-14; N-15; N-17; N-19; N-22; N-27; N-32; N-34; N-38

**Cautions:** C-2, C-4, C-6, C-8

**Warnings:** W-2; W-3; W-4; W-5; W-6; W-9; W-12; W-13; W-14; W-15; W-17; W-18; W-21; W-22; W-23; W-24; W-26; W-28; W-29; W-35; W-37
**Glossary**

**Acrylonitrile Butadiene Styrene (ABS) Plastics**
A group of plastics made from polymers with prescribed percentages of acrylonitrile, butadiene and styrene.

**Aging**  The effect on materials exposed to an environment for a period of time. Also, the act of exposing materials to an environment for a period of time.

**Beam Loading**  The process of applying a specified force (load) to a piece of pipe that is supported at two points. It is usually expressed in pounds per the distance between the centers of the supports.

**Belled-End**  A term used to describe a pipe end that has been enlarged to have the same inside dimensions as a fitting socket. It acts as a coupling when joining pipe.

**Condensation**  Condensation is the change of the physical state of matter from gas phase into liquid phase.

**Crazing**  Small, fine cracks on or under the surface of a plastic.

**Cure**  To change the properties of a polymer to a stable, usable, and final state by the use of chemical agents, heat or radiation.

**Deflection Temperature (Heat Distortion)**  The temperature which will cause a plastic specimen to deflect a certain distance when a specified load is applied.

**Degradation**  The process where the chemical structure, physical properties or appearance of plastics deteriorates.
**Glossary**

**Dimensional Stability**  The capability of a plastic part to maintain its original shape and dimensions under conditions of use.

**Elasticity**  The property of a plastic which allows it to return to its original dimensions after deformation.

**Elongation**  The percentage of the original length which a material will deform, under tension, without failing.

**Environmental Stress Cracking**  Cracks which develop when a plastic part is subjected to incompatible chemicals and put under stress.

**Extrusion**  The process used to continuously form a shape by forcing a heated or unheated plastic through a shaping orifice (die).

**Filler**  A relatively inert material added to a plastic to modify its strength, permanence, working properties, or other qualities, or to lower costs.

**Flexural Strength**  The measure of a material’s ability to withstand a specified deformation under a beam load (bending) at 73°F. Normally expressed in PSI.

**Forming**  A process in which the shapes of plastic pieces such as sheets, rods or tubes are changed to a desired configuration.

**Fuse**  To join plastic parts by softening the material with heat or solvents.

**Heat Resistance**  The ability of a material to withstand the effects of exposure to high temperatures.
**Glossary**

**Hoop Stress**  The circumferential stress imposed on a pipe wall when exposed to an internal pressure load. Usually expressed in PSI.

**Impact Strength**  A measure of a plastic part’s ability to withstand the effects of dropping and/or striking. There are two commonly used test methods, Notched Izod and Tup. Notched Izod uses a pendulum-type machine to strike a notched specimen. Tup testing uses a falling weight (tup) to strike a pipe or fitting specimen.

**Injection Molding**  The process used to form a shape by forcing a heated plastic, in a fluid state and under pressure, into the cavity of a closed mold.

**Joint**  The point where a pipe and fitting or two pieces of pipe are connected together.

**Lubricant**  Any substance which reduces the friction between moving solid surfaces.

**Modulus**  A term used to describe the load required to cause a specified percentage of elongation. It is usually expressed in PSI or kilograms per square centimeter.

**Non-flammable**  Incapable of supporting combustion.

**Plastic**  A material that contains as an essential ingredient one or more organic polymeric substances of large molecular weight, is solid in its finished state, and, at some stage in its manufacture or in its processing into finished articles, can be shaped by flow.

**Plastic Pipe**  A hollow cylinder of a plastic material in which the wall thicknesses are usually small when compared to the diameter and in which the inside and outside walls are essentially concentric.

**Plasticizer**  A substance incorporated in a plastic to increase its workability, flexibility or distensibility.
Glossary

**Pressure Rating**  The estimated maximum pressure a liquid can exert continuously inside the pipe at which the pipe will not fail.

**Primer**  Solvent used to soften joint surfaces prior to the application of solvent cement. It is usually tinted purple.

**Solvent Cement**  A mixture of solvents (chemicals) and plastic resins used to weld plastic pipe and fittings.

**Solvent Cementing**  Using a solvent cement to make a pipe joint.

**Standard Dimension Ratio (SDR) Pipe**  A type of pipe in which the dimension ratios are constant for any given class. Unlike “Schedule” pipe, the pressure rating remains constant for any specific class of SDR pipe, regardless of the pipe diameter.

**Stress Crack**  An external or internal crack in a plastic caused by tensile stresses less than its short-time mechanical strength.

**Thermal Expansion**  The increase in a length of a plastic part due to a change in temperature.

**Thermoplastics**  A group of plastics which can repeatedly be softened by heating and hardened by cooling.

**Thermosetting Plastics**  A group of plastics which, having been cured by heat, chemicals, or other means, are substantially infusable and insoluble. They are permanently hardened.

**Weld Line (Knit Line)**  A term used to describe a mark on a molded plastic part formed by the union of two or more streams of plastic flowing together.