

GENERAL INFORMATION

Plastics Technical Manual

Physical Properties of Charlotte Pipe® ABS and PVC Materials*

PROPERTY	UNITS	ABS	ASTM NO.	PVC	ASTM NO.
Specific Gravity	g/cc	1.05	D 792	1.40	D 792
Tensile Strength (73°F) Minimum	Psi	4,500	D 638	7,000	D 638
Modulus of Elasticity in Tension (73°F) Minimum	Psi	240,000	D 638	400,000	D 638
Flexural Strength (73°F)	Psi	10,585	D 790	14,000	D 790
Izod Impact (notched at 73°F) Minimum	ft lb/ in. of notch	6.00	D 256	0.65	D 256
Hardness (Durometer D)		70	D 2240	80 ± 3	D 2240
Hardness (Rockwell R)		100	D 785	110 - 120	D 785
Compressive Strength (73°F)	Psi	7,000	D 695	9,600	D 695
Hydrostatic Design Stress	Psi	N/A		2,000	D 1598
Coefficient of Linear Expansion	in./ in./ °F	5.5 x 10 ⁻⁵	D 696	3.0 x 10 ⁻⁵	D 696
Heat Distortion Temperature at 264 psi Minimum	degrees F	180	D 648	160	D 648
Coefficient of Thermal Conductivity	BTU/ hr/sq ft/ °F/ in.	1.1	C 177	1.2	C 177
Specific Heat	BTU/ °F/lb	0.35	D 2766	0.25	D 2766
Water Absorption (24 hrs at 73°F)	% weight gain	0.40	D 570	.05	D 570
Cell Classification - Pipe		42222	D 3965	12454	D 1784
Cell Classification - Fittings		32222	D 3965	12454	D 1784
Burning Rate				Self Ext.	D 635
Burning Class				V-0	UL 94**

*Above data is based upon information provided by the raw material manufacturers. It should be used only as a recommendation and not as a guarantee of performance. **Underwriters Laboratories standard

ABS and PVC Standards

TYPE PIPE / FITTING	STANDARD SPECIFICATIONS	
	MATERIAL	DIMENSIONS
ABS DWV		
Schedule 40 DWV Foam Core Pipe	ASTM D 3965	ASTM F 628
Schedule 40 DWV Fittings	ASTM D 3965	ASTM D 2661
PVC DWV		
Schedule 40 DWV Pipe	ASTM D 1784	ASTM D 2665 & ASTM D 1785
Schedule 40 DWV Foam Core Pipe	ASTM D 4396	ASTM F 891
Schedule 40 DWV Pipe with Recycled Content	ASTM D 4396	ASTM F 1760
Schedule 40 DWV Fittings	ASTM D 1784	ASTM D 2665
PVC Pressure		
Schedule 40 Plain End Pipe	ASTM D 1784	ASTM D 1785
Schedule 40 Bell End Pipe	ASTM D 1784	ASTM D 1785
Schedule 40 Bell End Well Casing	ASTM D 1784	ASTM D 1785 & ASTM F 480
SDR 21 (PR 200) Bell End Pipe	ASTM D 1784	ASTM D 2241
SDR 26 (PR 160) Bell End Pipe	ASTM D 1784	ASTM D 2241
Schedule 40 Fittings	ASTM D 1784	ASTM D 2466
Schedule 80 Plain End Pipe	ASTM D 1784	ASTM D 1785
Schedule 80 Fittings	ASTM D 1784	ASTM D 2464 & ASTM D 2467

Product Specification

System:	PVC Cellular Core (Foam Core) Pipe and PVC DWV Fitting Systems
Scope:	This specification covers PVC cellular core (foam core) pipe and PVC DWV fittings used in sanitary drain, waste, and vent (DWV), sewer, and storm drainage applications. This system is intended for use in non-pressure applications where the operating temperature will not exceed 140°F.
Specification:	<p>Pipe shall be manufactured from virgin rigid PVC (polyvinyl chloride) vinyl compounds with a Cell Class of 11432 as identified in ASTM D 4396. Fittings shall be manufactured from virgin rigid PVC (polyvinyl chloride) vinyl compounds with a Cell Class of 12454 as identified in ASTM D 1784.</p> <p>PVC cellular core pipe shall be Iron Pipe Size (IPS) conforming to ASTM F 891. PVC DWV fittings shall conform to ASTM D 2665. Pipe and fittings shall be manufactured as a system and be the product of one manufacturer. All pipe and fittings shall be manufactured in the United States. All systems shall utilize a separate waste and vent system. Pipe and fittings shall conform to NSF International Standard 14.</p> <p>Installation shall comply with the latest installation instructions published by Charlotte Pipe and Foundry and shall conform to all applicable plumbing, fire, and building code requirements. Buried pipe shall be installed in accordance with ASTM D 2321 and ASTM F 1668. Solvent cement joints shall be made in a two step process with primer conforming to ASTM F 656 and solvent cement conforming to ASTM D 2564. The system shall be protected from chemical agents, fire stopping materials, thread sealant, plasticized vinyl products, or other aggressive chemical agents not compatible with PVC compounds. Systems shall be hydrostatically tested after installation. WARNING! Never test with or transport/store compressed air or gas in PVC pipe or fittings.</p>

Referenced Standards*:

ASTM D 4396	Compounds for Cellular Core Pipe
ASTM F 891	Co-extruded PVC Pipe with Cellular Core
ASTM D 2665	PVC Drain, Waste, and Vent Fittings
ASTM D 2564	Solvent Cements for PVC Pipe and Fittings
ASTM D 2321	Underground Installation of Thermoplastic Pipe (non-pressure applications)
ASTM F 656	Primers for PVC Pipe and Fittings
ASTM F 1668	Procedures for Buried Plastic Pipe
NSF Standard 14	Plastic Piping Components and Related Materials

*Note: Latest revision of each standard applies.

Short Specification:

Pipe shall be manufactured from PVC compound with a cell class of 11432 per ASTM D 4396 and 12454 per ASTM D 1784 for fittings and conform with NSF International standard 14. Pipe shall be iron pipe size (IPS) conforming to ASTM F 891. Fittings shall conform to ASTM D 2665.

All pipe and fittings shall be produced by a single manufacturer and shall be installed in accordance with manufacturer’s recommendations and applicable code requirements. Buried pipe shall be installed in accordance with ASTM D 2321 and ASTM F 1668. Solvent cements shall conform to ASTM D 2564, primer shall conform to ASTM F 656. The system is to be manufactured by Charlotte Pipe and Foundry Company and is intended for non-pressure drainage applications where the temperature will not exceed 140°F.

Product Certification



This is to certify that all Plastic Pipe and Fittings manufactured by Charlotte Pipe and Foundry Company are manufactured in the United States and conform to the following standards:

SCH. 40 PVC PIPE

ASTM D 1784, ASTM D 1785, ASTM D 2665
FHA UM 79a
FEDERAL SPECIFICATION L-P-320a
NSF STANDARD 14 AND 61

SCH. 40 PVC DWV PIPE CELLULAR CORE

ASTM D 4396, ASTM F 891
NSF STANDARD NO. 14

RePVC® DWV PIPE WITH RECYCLED CONTENT

ASTM D 4396, ASTM F 1760
NSF STANDARD NO. 14

SCH. 40 PVC DWV FITTINGS

ASTM D 1784, ASTM D 2665, ASTM D 3311
FHA UM 79a
FEDERAL SPECIFICATION L-P-320a
NSF STANDARD NO. 14

PVC PRESSURE PIPE SDR-21 AND SDR-26

ASTM D 1784, ASTM D 2241
NSF STANDARD NO. 14 AND 61

PVC SCH. 40 PRESSURE FITTINGS

ASTM D 1784, ASTM D 2466
NSF STANDARD 14 AND 61

PVC WELL CASING PIPE

ASTM D 1784, ASTM F 480
NSF STANDARD NO. 14 AND 61

PVC SCH. 80 PIPE

ASTM D 1784, ASTM D 1785
NSF STANDARD NO. 14 AND 61

PVC SCH. 80 FITTINGS

ASTM D 1784, ASTM D 2467
ASTM D 2464 ASTM F 1970
NSF STANDARD NO. 14 AND 61

PVC SEWER MAIN PIPE

ASTM D 1784, ASTM D 3034, SDR 35
ASTM D 3212, ASTM F 477

PVC SEWER AND DRAIN PIPE

ASTM D 1784, ASTM D 2729

PVC THIN WALL PIPE AND FITTINGS

ASTM D 1784, ASTM D 2949
NSF STANDARD NO. 14

CPVC CTS FLOWGUARD GOLD® PIPE & FITTINGS

ASTM D 1784, ASTM D 2846
FHA UM-61a
NSF STANDARD NO. 14 AND 61
CSA LISTED ON SPECIFIED ITEMS

CPVC CTS REUZE® PIPE & FITTINGS

ASTM D 1784, ASTM D 2846
NSF STANDARD NO. 14

CHEMDRAIN® CPVC SCHEDULE 40 PIPE AND FITTINGS

ASTM D 1784, ASTM F 2618
NSF STANDARD 14

SCH. 40 ABS DWV PIPE CELLULAR CORE

ASTM D 3965, ASTM F 628
NSF STANDARD NO. 14

SCH. 40 ABS DWV FITTINGS

ASTM D 3965, ASTM D 2661, ASTM D 3311
FHA UM 79a
FEDERAL SPECIFICATION L-P-322b
NSF STANDARD NO. 14

CHARLOTTE PIPE AND FOUNDRY COMPANY

PVC Foam Core DWV Pipe

NSF

>> PVC Schedule 40 DWV Pipe

PVC SCHEDULE 40 FOAM CORE (WHITE)			PLAIN END	FOR NON-PRESSURE APPLICATIONS		ASTM F 891
PART NO.	NOM. SIZE	UPC # 611942-		AVG. OD (IN.)	MIN. WALL (IN.)	WT. PER 100 FT. (LBS.)
PVC 4112	1½" x 10'	04178		1.900	0.145	38.1
PVC 4112	1½" x 20'	04177		1.900	0.145	38.1
PVC 4200	2" x 10'	04174		2.375	0.154	51.2
PVC 4200	2" x 20'	04173		2.375	0.154	51.2
PVC 4300	3" x 10'	03934		3.500	0.216	105.0
PVC 4300	3" x 20'	03935		3.500	0.216	105.0
PVC 4400	4" x 10'	03936		4.500	0.237	146.0
PVC 4400	4" x 20'	03937		4.500	0.237	146.0
PVC 4600	6" x 10'	03938		6.625	0.280	247.0
PVC 4600	6" x 20'	03939		6.625	0.280	247.0
PVC 4800	8" x 20'	03941		8.625	0.322	371.0
PVC 4910	10" x 20'	03942		10.750	0.365	566.0
PVC 4912	12" x 20'	03943		12.750	0.406	755.0

PVC SCHEDULE 40 FOAM CORE (WHITE)			BELL-END	FOR NON-PRESSURE APPLICATIONS	
PART NO.	NOM. SIZE	UPC # 611942-	AVG. OD (IN.)	MIN. WALL (IN.)	WT. PER 100 FT. (LBS.)
PVC 4300B	3'' x 20'	04782	3.500	0.216	105.0
PVC 4400B	4'' x 10'	04783	4.500	0.237	146.0
PVC 4400B	4'' x 20'	04784	4.500	0.237	146.0
PVC 4600B	6'' x 20'	04786	6.625	0.280	247.0

NOTE: When ordering, please specify plain end or bell-end.

NSF Listed. Meets All Requirements of ASTM F 891.

NOTICE

NOT FOR PRESSURE

Do not use PVC / ABS cellular core (foam core) pipe for pressure applications. The use of cellular core pipe in pressure applications may result in system failure and property damage.

⚠ 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.

AIR/GAS



- 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 for water or approved chemicals.
- Refer to warnings in PPFA User Bulletin 4-80 and ASTM D 1785.

Support Spacing For ABS, PVC and CPVC Pipe

Adequate support for any piping system is a matter of great importance. In practice, support spacings are a function of pipe size, operating temperatures, the location of heavy valves or fittings, and the mechanical properties of the pipe material.

To ensure the satisfactory operation of a DWV or pressure piping system, the location and type of hangers should be carefully considered. The principles of design for metallic piping systems are generally also applicable to DWV or pressure piping systems, but with some notable areas where special consideration should be exercised. Hangers should not compress, distort, cut or abrade the piping.

All piping should be supported with an approved hanger at intervals sufficiently close to maintain correct pipe alignment and to prevent sagging or grade reversal. Pipe should also be supported at all branch ends and at all changes of direction. Support trap arms as close as possible to the trap. In keeping with good plumbing practices, support and brace all closet bends and fasten closet flanges.

- (1) Concentrated loads should be supported directly so as to eliminate high stress concentrations. Should this be impractical, then the pipe must be supported immediately adjacent to the load.
- (2) In systems where large fluctuations in temperature occur, allowances must be made for expansion and contraction of the piping system. Since changes in direction in the system are usually sufficient to allow for expansion and contraction, hangers must be placed so as not to restrict this movement.

- (3) Since plastic pipe expands or contracts approximately five times more than steel, hangers should not restrict this movement. When using a clamp-type hanger, the hanger should not force the pipe and fittings into position.
- (4) Hangers should provide as much bearing surface as possible. To prevent damage to the pipe, file smooth any sharp edges or burrs on the hangers or supports.
- (5) Plastic piping systems must not be placed alongside steam or other high temperature pipe lines or other high temperature objects.
- (6) Support spacing for horizontal piping systems must be determined by the maximum operating temperature the system will encounter. The piping should be supported on uniform centers with supports that do not restrict the axial movement.
- (7) For vertical lines, it is recommended that an engineer design the vertical supports according to the vertical load involved.
- (8) Changes in direction should be supported as close as practical to the fitting to avoid introducing excessive torsional stresses into the system. Please see the associated chart showing the recommended support spacing according to size, schedule, and operating temperatures. These spacings apply to continuous spans of uninsulated lines, with no concentrated loads, conveying liquids with specific gravities of up to 1.00.

NOTICE: The above information provides general guidelines. It should be used only as a reference and not as a guarantee of performance. Specific installation instructions and techniques may be required as a result of local plumbing and building codes, engineering specifications and instructions.

NOTICE

Failure to compensate for expansion and contraction caused by temperature change may result in system failure and property damage.

- Do not restrict expansion or contraction. Restraining movement in piping systems is not recommended and may result in joint or fitting failure.
- Use straps or clamps that allow for piping system movement.
- Align all piping system components properly without strain. Do not bend or pull pipe into position after being solvent welded.
- Do not terminate a pipe run against an immovable object (example: wall or floor joist)

General Guidelines for Horizontal Support Spacing (in feet)

Nom. Pipe Size (in.)	PVC PIPE																ABS PIPE						
	SDR 21 PR200 & SDR 26 PR160					Schedule 40					Schedule 80						Schedule 40						
						Operating Temp. °F					Operating Temp. °F					Operating Temp. °F						Operating Temp. °F	
	60	80	100	120	140	60	80	100	120	140	60	80	100	120	140		60	80	100	120	140	160	
½	3½	3½	3	2		4½	4½	4	2½	2½	5	4½	4½	3	2½								
¾	4	3½	3	2		5	4½	4	2½	2½	5½	5	4½	3	2½								
1	4	4	3½	2		5½	5	4½	3	2½	6	5½	5	3½	3								
1¼	4	4	3½	2½		5½	5½	5	3	3	6	6	5½	3½	3								
1½	4½	4	4	2½		6	5½	5	3½	3	6½	6	5½	3½	3½		6	6	5½	3½	3	3	
2	4½	4	4	3		6	5½	5	3½	3	7	6½	6	4	3½		6	6	5½	3½	3	3	
2½	5	5	4½	3		7	6½	6	4	3½	7½	7½	6½	4½	4								
3	5½	5½	4½	3		7	7	6	4	3½	8	7½	7	4½	4		7	7	7	4	3½	3½	
4	6	5½	5	3½		7½	7	6½	4½	4	9	8½	7½	5	4½		7½	7½	7	4½	4	4	
6	6½	6½	5½	4		8½	8	7½	5	4½	10	9½	9	6	5		8½	8½	8	5	4½	4½	
8	7	6½	6	5		9	8½	8	5	4½	11	10½	9½	6½	5½								
10						10	9	8½	5½	5	12	11	10	7	6								
12						11½	10½	9½	6½	5½	13	12	10½	7½	6½								
14						12	11	10	7	6	13½	13	11	8	7								
16						12½	11½	10½	7½	6½	14	13½	11½	8½	7½								

NOTE: Always follow local code requirements for hanger spacing. Most plumbing codes have the following hanger spacing requirements:







- ABS and PVC pipe have a maximum horizontal hanger spacing of every four feet for all sizes.
- CPVC pipe or tubing has a maximum horizontal hanger spacing of every three feet for one inch and under and every four feet for sizes 1¼ inch and larger.

General Guidelines for Horizontal Support Spacing (in feet)

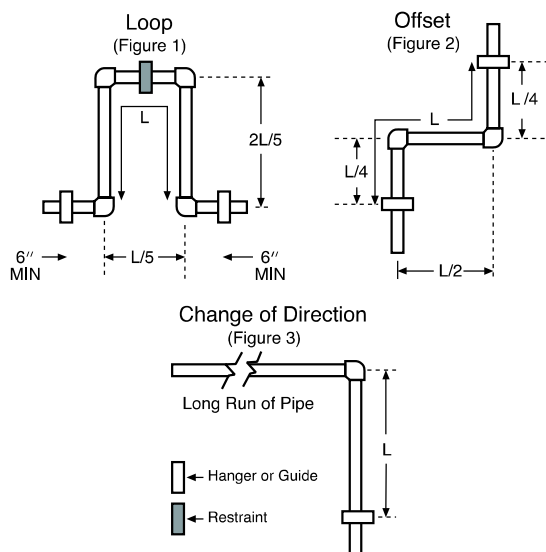
Nom. Pipe Size (in.)	CPVC PIPE									
	Schedule 80*						SDR 11			
	Operating Temp. °F						Operating Temp. °F			
	60	80	100	120	140	180	73	100	140	180
½	5½	5½	5	4½	4½	2½	4	4	3½	3
¾	5½	5½	5½	5	4½	2½	5	4½	4	3
1	6	6	6	5½	5	3	5½	5	4½	3
1¼	6½	6½	6	6	5½	3	6	5½	5	4
1½	7	7	6½	6	5½	3½	6½	6	5½	4
2	7	7	7	6½	6	3½	7½	7	6½	4
2½	8	7½	7½	7½	6½	4				
3	8	8	8	7½	7	4				
4	9	9	9	8½	7½	4½				
6	10	10½	9½	9	8	5				
8	11	11	10½	10	9	5½				
10	11½	11½	11	10½	9½	6				
12	12½	12½	12½	11	10½	6½				

*Note: This product is not currently available. Information provided is for reference only.

Typical Pipe Hangers, Clamps, and Supports

		
Double Bolt Pipe Clamp ¼ to 36 in. pipe	Anchor Strap ½ to 4 in. pipe	Split Ring Hanger Adj. Swivel Ring ¼ to 8 in. pipe
		
Clevis Hanger ½ to 30 in. pipe	Adj. Swivel Ring ½ to 8 in. pipe	Roller Hanger 2½ to 20 in. pipe

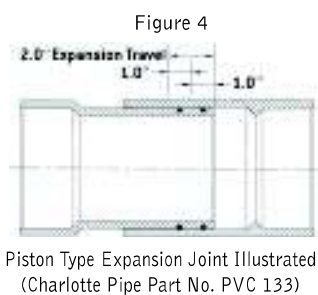
The pipe should not be anchored tightly by the support, but secured in a manner to allow for movement caused by thermal expansion and contraction. It is recommended that you use clamps or straps that allow pipe to remain away from the framing, thus reducing the noise generated when pipe is allowed to rub against wood.



Thermal Expansion in DWV Systems

Secure above-ground vertical DWV or storm-drainage piping at sufficiently close intervals to maintain proper alignment and to support the weight of the piping and its contents. Support stack at base, and if over two stories in height, support stack at base and at each floor with approved riser clamps. Stacks should be anchored so that movement is directed to the offset or expansion joint. For vertical stacks in multi-story applications, compensation for expansion, contraction or building settling is recommended. This can be accomplished by installing a horizontal offset (Fig. 2) or expansion joint (Fig. 4) at a minimum of every other floor. Expansion joints should be installed in the neutral position. Compensation for thermal movements is usually not required for a vent system.

Note: Expansion joints are lubricated. If sand or dirt comes in contact with the lubricant, the O-rings can become damaged and leaks will result. Please keep clean until ready to use. If the expansion joint is stuck and will not move, tap lightly to break the lubricant seal.



NOTICE

Failure to compensate for expansion and contraction caused by temperature change may result in system failure and property damage.

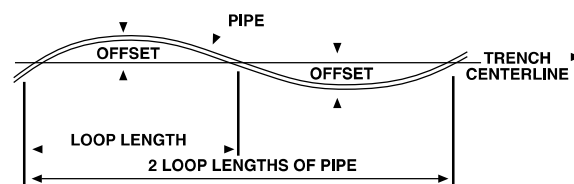
- Do not restrict expansion or contraction. Restraining movement in piping systems is not recommended and may result in joint or fitting failure.
- Use straps or clamps that allow for piping system movement.
- Align all piping system components properly without strain. Do not bend or pull pipe into position after being solvent welded.
- Do not terminate a pipe run against an immovable object (example: wall or floor joist)

Thermal Expansion in Underground Systems

Compensation for expansion and contraction in underground applications is normally achieved by snaking the pipe in the trench. Solvent cemented joints must be used.

The following table shows recommended offsets and loop lengths for piping up to 3" nominal size.

Loop Length In Feet	Max. Temp. Variation °F, Between Installation and Final Operation									
	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°
	Loop Offset In Inches									
20	3.0	3.5	4.5	5.0	6.0	6.5	7.0	7.0	8.0	8.0
50	7.0	9.0	11.0	13.0	14.0	15.5	17.0	18.0	19.0	20.0
100	13.0	18.0	22.0	26.0	29.0	31.5	35.0	37.0	40.0	42.0



Note: This manual is not a complete engineering reference addressing all aspects of design and installation of thermal expansion in piping systems. Many excellent references are available on this topic. The American Society of Plumbing Engineers (www.ASPE.org) Data Book, Volume 4, 2008, Chapter 11 is an excellent resource for engineers on designing for thermal expansion.

INSTALLATION PROCEDURES

Solvent Cements

Pipe and Fitting System	Diameter (in.)	Solvent Cement Standard	Cement Color (common usage, check local code)	Description	Primer (common usage, check local code)
ABS DWV	1½ - 6	ASTM D 2235	Black	Regular or Medium-Bodied	Not Recommended
FlowGuard Gold® and ReUze® CTS CPVC	½ - 2	ASTM F 493	Yellow	Regular-Bodied	Optional
CPVC Sch. 80	½ - 2	ASTM F 493	IPS 714 or Oatey CPVC Heavy Duty Orange	Heavy-Bodied	IPS P-70 or Oatey Industrial Grade
CPVC Sch. 80	2½ - 8	ASTM F 493	IPS 714 or Oatey CPVC Heavy Duty Orange	Heavy-Bodied	IPS P-70 or Oatey Industrial Grade
CPVC Sch. 40 ChemDrain	1¼ - 8	ASTM F 493	ChemDrain Mustard Yellow (Required)	Heavy-Bodied	6" and larger: IPS P-70 or Oatey Industrial Grade required
PVC DWV or Sch. 40 Pressure	½ - 4	ASTM D 2564	Clear	Regular or Medium-Bodied	Required ASTM F 656
PVC DWV or Sch. 40 Pressure	6 - 16	ASTM D 2564	Clear or Grey	Medium or Heavy-Bodied	Required ASTM F 656
PVC Sch. 80	¾ - 2	ASTM D 2564	Grey	Medium or Heavy-Bodied	Required ASTM F 656
PVC Sch. 80	2½ - 16	ASTM D 2564	Grey	Heavy-Bodied	IPS P-70 or Oatey Industrial Grade

NOTICE: Aerosol or spray-on type primers/solvent cements are not recommended. The practice of aggressively scouring the pipe and fittings with both primer and solvent cement is an integral part of the joining process. Not working the primer or solvent cement into the pipe or fitting could cause potential system failure or property damage.



WARNING

Primers and cements are extremely flammable and may be explosive. Do not store or use near heat or open flame, or death or serious injury may occur.

- Solvent fumes created during the joining process are heavier than air and may be trapped in newly installed piping systems.
- Ignition of the solvent vapors caused by spark or flame may result in injury or death from explosion or fire.
- Read and obey all manufacturers' warnings and any instructions pertaining to primers and cements.
- Provide adequate ventilation to reduce fire hazard and to minimize inhalation of solvent vapors when working with cements, primers and new piping systems.

Applicator Types

Nominal Pipe Size (in.)	Applicator Type		
	Dauber	Brush Width (in.)	Swab Length (in.)
¼	A	½	NR
⅜	A	½	NR
½	A	½	NR
¾	A	1	NR
1	A	1	NR
1¼	A	1	NR
1½	A	1 - 1½	NR
2	A	1 - 1½	NR
2½	NR	1½ - 2	NR
3	NR	1½ - 2½	NR
4	NR	2 - 3	3
6	NR	3 - 5	3
8	NR	4 - 6	7
10	NR	6 - 8	7
12	NR	6 - 8	7
14	NR	7 - 8	7
16	NR	8+	8

A = Acceptable

NR = Not Recommended

NOTICE: Rollers are not recommended.

Joint Curing

The joint should not be disturbed until it has initially set. The chart below shows the recommended initial set and cure times for ABS, PVC and CPVC in iron pipe size diameters as well as for FlowGuard Gold® and ReUze® CTS CPVC.

Recommended Initial Set Times

Temperature Range	Diameter ½" to 1¼"	Diameter 1½" to 3"	Diameter 4" to 8"	Diameter 10" to 16"
60° - 100° F	15 min	30 min	1 hr	2 hr
40° - 60° F	1 hr	2 hr	4 hr	8 hr
0° - 40° F	3 hr	6 hr	12 hr	24 hr

NOTICE

A joint should not be pressure tested until it has cured. The exact curing time varies with temperature, humidity, and pipe size. The presence of hot water extends the cure time required for pressure testing. Pressurization prior to joint curing may result in system failure.

Recommended Curing Time Before Pressure Testing

RELATIVE HUMIDITY 60% or Less*	CURE TIME Diameter ½" to 1¼"		CURE TIME Diameter 1½" to 3"		CURE TIME Diameter 4" to 8"		CURE TIME Diameter 10" to 16"
Temperature Range During Assembly and Cure Periods	Up to 180 psi	Above 180 to 370 psi	Up to 180 psi	Above 180 to 315 psi	Up to 180 psi	Above 180 to 315 psi	Up to 100 psi
60° - 100° F	1 hr	6 hr	2 hr	12 hr	6 hr	24 hr	24 hr
40° - 60° F	2 hr	12 hr	4 hr	24 hr	12 hr	48 hr	48 hr
0° - 40° F	8 hr	48 hr	16 hr	96 hr	48 hr	8 days	8 days

*For relative humidity above 60%, allow 50% more cure time.

The above data are based on laboratory tests and are intended as guidelines.

For more specific information, contact should be made with the cement manufacturer.

*Average number of joints per Quart for Cement and Primer (Source: IPS Weld-on)

Pipe Diameter	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	15"	18"
Number of Joints	300	200	125	90	60	40	30	10	5	2 to 3	1 to 2	¾	½

For Primer: double the number of joints shown for cement.

* These figures are estimates based on IPS Weld-on laboratory tests.

Due to many variables in the field, these figures should be used as a general guide only.