CORZAN®

Submittal Data Sheet

Job or Customer: ....

Engineer: ....

Contractor: ....

Submitted by: .... Date

Approved by: .... Date

Order No: .... Date

Specification: ....

introduction

< STANDARDS >

ASTM D1784
ASTM F441
ASTM F439
ASTM F437
ASTM F1970

CAN/ULC
S102.2

CPVC has physical properties similar to those of PVC and chemical resistance similar to or generally better than that of PVC. The design stress of CPVC is also 2,000psi at 73°F (23°C). The maximum service temperature is 200°F (93°C) under pressure with occasional exposure to boiling water (212°F, 100°C). CPVC has proved to be an excellent piping material for hot corrosive liquids, hot and cold water distribution and similar applications above the temperature range of PVC.

NSF 14
NSF 61

CSA B137.6

Please see our listing on agency websites for NSF and CSA compliant fittings.

www.nsf.org
www.CSAgroup.org

IPEX
Committed to Excellence

material properties

Properties	CPVC	CPVC (High Impact)	Standards
Cell classification	23447	24448	ASTM D1784
Specific gravity	1.5	1.51	ASTM D792
Tensile strength, psi at 73°F	7,500	7,320	ASTM D638
Modulus of elasticity tensile, psi at 73°F	380,000	423,000	ASTM D638
Flexural strength, psi	11,400	13,200	ASTM D790
Izod impact, ft.lbs./in. at 73°F, notched	2.0	10.0	ASTM D256
Compressive strength, psi	10,100	10,100	ASTM D695
Poisson's ratio	0.33	0.33	
Working stress, psi at 73°F	2,000	2,000	
Coefficient of thermal expansion in./in./°F (x 10^{-5})	3.8	3.4	ASTM D696
Linear expansion, in./10°F per 100' of pipe	0.44 - 0.46	0.41	
Maximum operating temperature under pressure	200ºF (93ºC)	200ºF (93ºC)	
Deflection temperature under load, °F at 66 psi	n/a	n/a	ASTM D648
Deflection temperature under load, °F at 264 psi	212	239	ASTM D648
Thermal conductivity, BTU.in./hr.ft^2.°F	0.95	0.95	ASTM C177
Burning rate	Self extinguish	Self extinguish	ASTM D635
Burning class	V-0	V-0	UL-94
Flash ignition, °F	900	900	
Limited oxygen index (%)	60	60	ASTM D2863-70
Water absorption, %, (24 hrs. at 73°F)	0.03	0.03	ASTM D570

pipe availability

Pipe Size

Schedule 40 Grey	Schedule 80 Grey
1/2" - 16"	1/2" - 16"

molded fittings availability

Fittings	Size (inches) Schedule 80
Tee (Soc)	1/4" - 12"
Reducing Tee (Soc)	3/4" - 10" x 3/4" - 10" x 1/2" - 6"
Tee (Soc x Soc x Fpt)	1/2" - 2"
Tee (Fpt)	1/4" - 4"
90° Elbow (Soc)	1/4" - 12"
90° Elbow (Soc x Fpt)	1/4" - 2"
90° Elbow (Fpt)	1/4" - 4"
45° Elbow (Soc)	1/4" - 12"
45° Elbow (Fpt)	1/4" - 4"
22-1/2° Elbow (Soc)	2" - 4"
11-1/4° Elbow (Soc)	2" - 4"
30° Elbow (Soc)	6"
Cross (Soc)	1/4" - 4"
Coupling (Fpt)	1/4" - 4"
Coupling (Soc)	1/4" - 8"
Reducer Coupling (Soc)	3/4" - 8' x 1/2" - 6"
Female Adapter (Soc x Fpt)	1/4" - 4"
Female Adapter (Soc x Fpt SS Reinforced)	1/2" - 4"
Female Adapter (Spig x Fpt SS Reinforced)	1/2" - 4"
Male Adapter (Soc x Mpt)	1/2" - 4"
Reducer Bushing (Spig x Soc)	3/8" - 8" x 1/4" - 6"
Reducer Bushing (Spig x Fpt)	3/8" - 6" x 1/4" - 4"
Reducer Bushing (Mpt x Fpt)	3/8" - 4" x 1/4" 3"
Cap (Soc)	1/4" - 8"
Cap (Fpt)	1/4" - 4"
Plug (Mpt)	1/4" - 4"
Wye (Soc)	1/2" - 6"

fabricated fittings availability

Fittings	Size (inches) Schedule 80
Fabricated Tee (Soc)	14" - 16"
Fabricated Reducing Tee (Soc)	12" x 12" x 8"
Fabricated 90° Elbow (Soc)	14" - 16"
Fabricated 45° Elbow (Soc)	14" - 16"
Fabricated Coupling (Soc)	10" - 16"
Fabricated Reducer Bushing (Spig x Soc)	10" - 12" x 6" - 10"
Fabricated Cap (Soc)	10" - 16"
Fabricated Vanstone Flange (Soc)	14" - 16"
Blind Flange	10" - 12"
Heavy Duty Vanstone Flange (Soc)	16"
Vanstone Flange (Spig)	10" - 12"
Nipples	1/4" - 4"
Expansion Joints	1/2" - 4"

ASTM F1970 fittings availability

Fittings	Size (inches) Schedule 80
One Piece Flange (Soc)	1/2" - 8"
One Piece Flange (Fpt)	1/2" - 4"
Blind Flange	1/2" - 8"
Heavy Duty Vanstone Flange (Soc)	1/2" - 12"
Vanstone Flange (Fpt)	1/2" - 4"
Vanstone Flange (Spig)	1/2" - 8"
Union (Soc)	1/4" - 4"
Union (Fpt)	1/4" - 4"
Wye	1 1/2" - 6"

installation

To make consistently tight joints, the following points of solvent cementing should be clearly understood:

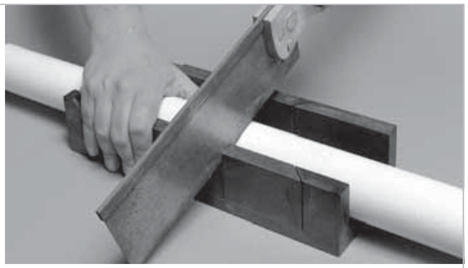
1. The joining surfaces must be softened and made semi-fluid.
2. Sufficient cement must be applied to fill the gap between pipe and fittings.
3. Assembly of pipe and fittings must be made while the surfaces are still wet and fluid.
4. Joint strength will develop as the cement cures. In the tight part of the joint, surfaces tend to fuse together; in the loose part, the cement bonds to both surfaces.

Step 1: Preparation

Assemble proper materials for the job. This includes the appropriate cement, primer and applicator for the size of piping system to be assembled.

Step 2: Cut Pipe

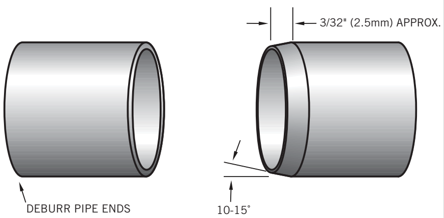
Pipe must be cut as square as possible. (A diagonal cut reduces bonding area in the most effective part of the joint.) Use a handsaw and miter box or a mechanical saw.



Plastic tubing cutters may also be used for cutting plastic pipe; however, some produce a raised bead at the end of the pipe. This bead must be removed with a file or reamer, as it will wipe the cement away when pipe is inserted into the fitting.

Step 3: Deburr Pipe Ends

Use a knife, plastic pipe deburring tool, or file to remove burrs from the end of small diameter pipe. Be sure to remove all burrs from around the inside as well as the outside of the pipe. A slight chamfer (bevel) of about 15° should be added to the end to permit easier insertion of the pipe into the fitting. Failure to chamfer the edge of the pipe may remove cement from the fitting socket, causing the joint to leak. For pressure pipe systems of 2" and above, the pipe must be end-treated with a 15° chamfer cut to a depth of approximately 3/32" (2.5mm).



Step 4: Clean Pipe Ends

Remove all dirt, grease and moisture. A thorough wipe with a clean dry rag is usually sufficient. (Moisture will retard cure, dirt or grease can prevent adhesion).

Step 5: Check Fit

Check pipe and fittings for dry fit before cementing together. For proper interference fit, the pipe must go easily into the fitting one quarter to three quarters of the way. Too tight a fit is not desirable; you must be able to fully bottom the pipe in the socket during assembly. If the pipe and fittings are not out of round, a satisfactory joint can be made if there is a “net” fit, that is, the pipe bottoms in the fitting socket with no interference, without slop.

All pipe and fittings must conform to ASTM and other recognized standards.

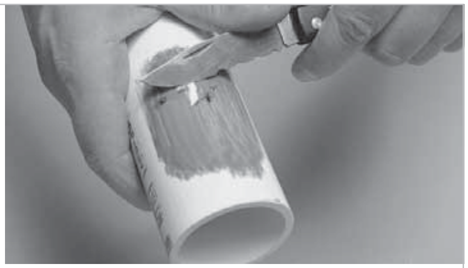
Step 6: Select Applicator

Ensure that the right applicator is being used for the size of pipe or fittings being joined. The applicator size should be equal to half the pipe diameter. It is important that a proper size applicator be used to help ensure that sufficient layers of cement and primer are applied.

Step 7: Priming

The purpose of a primer is to penetrate and soften pipe surfaces so that they can fuse together. The proper use of a primer provides assurance that the surfaces are prepared for fusion.

Check the penetration or softening on a piece of scrap before you start the installation or if the weather changes during the day. Using a knife or other sharp object, drag the edge over the coated surface. Proper penetration has been made if you can scratch or scrape a few thousandths of an inch of the primed surfaces away.



Weather conditions can affect priming and cementing action, so be aware of the following:

- repeated applications to either or both surfaces may be necessary
- in cold weather, more time may be required for proper penetration
- in hot weather, penetration time may be shortened due to rapid evaporation

Step 8: Primer Application

Using the correct applicator, aggressively work the primer into the fitting socket, keeping the surface and applicator wet until the surface has been softened. More applications may be needed for hard surfaces and cold weather conditions. Re-dip the applicator in primer as required. When the surface is primed, remove any puddles of primer from the socket.

Step 9: Primer Application

Next, aggressively work the primer on to the end of the pipe to a point 1/2" beyond the depth of the fitting socket.

Immediately and while the surfaces are still wet, apply the appropriate IPEX cement.

Step 10: Cement Application

Stir the cement or shake can before using. Using the correct size applicator, aggressively work a full even layer of cement on to the pipe end equal to the depth of the fitting socket. Do not brush it out to a thin paint type layer, as this will dry within a few seconds.

Step 11: Cement Application

Aggressively work a medium layer of cement into the fitting socket.

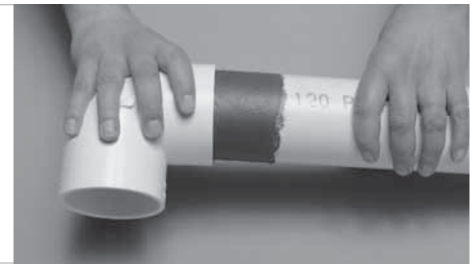
Avoid puddling the cement in the socket. On bell end pipe do not coat beyond the socket depth or allow cement to run down into the pipe beyond the spigot end.

Step 12: Cement Application

Apply a second full, even layer of cement on the pipe.

Step 13: Assembly

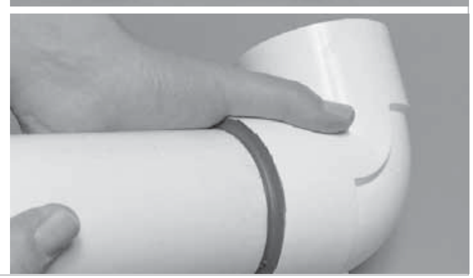
Without delay, while the cement is still wet, assemble the pipe and fittings. Use sufficient force to ensure that the pipe bottoms in the fitting socket. If possible, twist the pipe a quarter turn as you insert it.



Step 14: Assembly

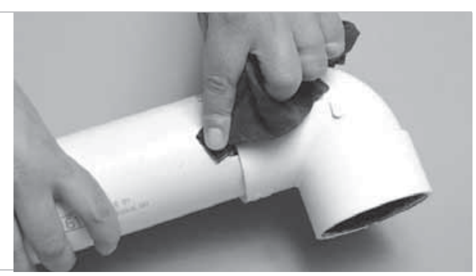
Hold the pipe and fitting together for approximately 30 seconds to avoid push out.

After assembly, a joint should have a ring or bead of cement completely around the juncture of the pipe and fitting. If voids in this ring are present, sufficient cement was not applied and the joint may be defective.



Step 15: Joint Cleaning

Using a rag, remove the excess cement from the pipe and fitting, including the ring or bead, as it will needlessly soften the pipe and fitting and does not add to joint strength. Avoid disturbing or moving the joint.



Step 16: Joint Setting & Curing

Handle newly assembled joints carefully until initial set has taken place. Allow curing to take place before pressurizing the system. (Note: in humid weather allow for 50% more curing time.)

For initial set and cure times for IPEX cements, refer to the table on page 10.

Cold Weather

Although normal installation temperatures are between 40°F (4°C) and 110°F (43°C), high strength joints have been made at temperatures as low as –15°F (–26°C).

In cold weather, solvents penetrate and soften the plastic pipe and fitting surfaces more slowly than in warm weather. In this situation, the plastic is more resistant to solvent attack and it becomes even more important to pre-soften surfaces with an aggressive primer. Be aware that because of slower evaporation, a longer cure time is necessary.

Tips for solvent cementing in cold weather

- Prefabricate as much of the system as is possible in a heated work area.
- Store cements and primers in a warmer area when not in use and make sure they remain fluid.
- Take special care to remove moisture including ice and snow from the surfaces to be joined.
- Ensure that the temperature of the materials to be joined (re: pipe and fittings) is similar.
- Use an IPEX Primer to soften the joining surfaces before applying cement. More than one application may be necessary.
- Allow a longer cure period before the system is used. Note: A heat blanket may be used to speed up the set and cure times.

Hot Weather

There are many occasions when solvent cementing plastic pipe at 95ºF (35ºC) temperatures and above cannot be avoided. If special precautions are taken, problems can be avoided.

Solvent cements for plastic pipe contain high-strength solvents which evaporate faster at elevated temperatures. This is especially true when there is a hot wind blowing. If the pipe is stored in direct sunlight, the pipe surface temperatures may be 20ºF to 30ºF (10ºC to 15ºC) higher than the ambient temperature. In this situation, the plastic is less resistant to attack and the solvents will attack faster and deeper, especially inside a joint. It is therefore very important to avoid puddling the cement inside the fitting socket and to ensure that any excess cement outside the joint is wiped off.

Tips for solvent cementing in hot weather:

- Store solvent cements and primers in a cool or shaded area prior to use.
- If possible, store fittings and pipe or at least the ends to be solvent welded, in a shady area before cementing.
- Try to do the solvent cementing in cooler morning hours.
- Cool surfaces to be joined by wiping with a damp rag.
- Make sure that the surface is dry prior to applying solvent cement.
- Make sure that both surfaces to be joined are still wet with cement when putting them together. With large size pipe, more people on the crew may be necessary.
- Using a primer and a heavier, high-viscosity cement will provide a little more working time.

Note: During hot weather the expansion-contraction factor may increase. Refer to the expansion-contraction design criteria in this manual.

Joint Cure Schedule

Temperature Range (ºF)	Temperature Range (ºC)	Pipe Size (in) & system operating pressure							
		1/2 to 1-1/4		1-1/2 to 2		2-1/2 to 8		10 to 14	>16
		<160psi	160 - 370psi	<160psi	160 - 315psi	<160psi	160 - 315psi	<100psi	<100psi
60 to 100	16 to 38	15 min	6 hr	30 min	12 hr	1-1/2hr	24 hr	48 hr	72 hr
40 to 60	4 to 16	20 min	12 hr	45 min	24 hr	4 hr	48 hr	96 hr	6 days
0 to 40	–18 to 4	30 min	48 hr	1 hr	96 hr	72 hr	8 days	8 days	14 days

* The figures in the table are estimates based on laboratory tests for water applications (chemical applications may require different set times). In damp or humid weather allow 50% more cure time (relative humidity over 60%).

Note 1: Due to the many variables in the field, these figures should be used as a general guideline only.

Note 2: Joint cure schedule is the necessary time needed before pressurizing the system.

joining methods – threading

Characteristics

Threading of CPVC pipe is only recommended for Schedule 80. The wall thickness is diminished at the point of threading and thereby reduces the maximum working pressure by 50%. Because of this, threaded pipe should not be used in high pressure systems nor in areas where a leak might endanger personnel. Threaded joints will not withstand constant or extreme stress and strain and must be supported or hung with this in mind. The threading of pipe sizes above 4" is not recommended.

Note: Using threaded CPVC products at or near the maximum temperature range should be avoided. Consult IPEX for specific details.

Tools & Equipment

- Power threading machine
- Threading ratchet and pipe vise (if hand pipe stock is used)
- Pipe dies designed for plastic
- Strap wrench
- Teflon* tape (PTFE)
- Cutting and de-burring tool
- Ring gauge (L-1)

*Trademark of the E.I. DuPont Company

Making the Pipe Thread

1. Cutting and Deburring

CPVC pipe should be cut square and smooth for easy and accurate threading. A miter box or similar guide should be used when sawing is done by hand. Burrs should be removed inside and out using a knife or plastic pipe deburring tool.

2. Threading

Threading Schedule 80 CPVC pipe can be easily accomplished using either a standard hand pipe stock or a power operated tool. Cutting dies should be clean and sharp.

Power-threading machines should be fitted with dies having a 5º negative front rake and ground especially for plastic pipe. Self opening die heads, and a slight chamfer to lead the dies will speed the operation; however, dies should not be driven at high speeds or with heavy pressure.

When using a hand-held cutter, the pipe should be held in a pipe vise. To prevent crushing or scoring of the pipe by the vise jaws, some type of protective wrap such as canvas, emery paper, rubber or light metal sleeve should be used.

For hand stocks, the dies should have a negative front rake angle of 5° to 10°. CPVC is readily threaded and caution should be taken not to over-thread. This procedure is best done in a shop or fabricating plant. Thread dimensional specifications can be found in Table 25 under *"Joining Methods – Threading"* in the IPEX Industrial Technical Manual Series, *"Volume I: Vinyl Process Piping Systems"*, American National Standard Taper Pipe Threads (NPT).

Installation Guidelines

1. Preparing the Threaded Pipe

A ring gauge should be used to check the accuracy of the threads.

Tolerance = ±1-1/2 turns.

The threads should be cleaned by brushing away cuttings and ribbons. After cleaning, apply an IPEX recommended thread lubricant such as Teflon® tape (PTFE) to the threaded portion of the pipe.

Wrap the tape around the entire length of threads beginning with number two thread from the end. The tape should slightly overlap itself going in the same direction as the threads. This will prevent the tape from unraveling when the fitting is tightened on the pipe. Overlapping in the wrong direction and the use of too much tape can affect tolerances between threads. This can generate stress in the wall of female fittings resulting in failure during operations.

2. Assembly of Threaded Joints and Unions

After applying thread tape, screw the threaded fitting onto the pipe. Screwed fittings should be started carefully and hand tightened. Threads must be properly cut and a good quality thread tape must be used. If desired, the joint may be tightened with a strap wrench. In NO INSTANCE should a pipe or chain wrench be used as the jaws of this type of wrench will scar and damage the pipe wall.

Fittings should be threaded together until hand tight with an additional 1/2 to 1 turns more. Avoid stretching or distorting the pipe, fittings or threads by over tightening.

Note 1: Never apply solvent cement to threaded pipe or threaded fittings. Do not allow cleaners, primers, or solvent cements to "run" or drip into the threaded portion of the fitting.

Note 2: Avoid screwing metallic male threads into plastic female threads, except those that have metal reinforcement. Consult the factory or your IPEX sales representative for the availability of these metal reinforced fittings.

Note 3: It is recommended that thread tape be used when connecting union ends to threaded pipe. However, thread tape is not needed on the union threaded interface assembly.

joining methods – flanging

Introduction

Flanging is used extensively for plastic process lines that require periodic dismantling. Thermoplastic flanges and factory flanged fittings in CPVC are available in a full range of sizes and types for joining to pipe by solvent welding and threading. Gasket seals between the flange faces should be an elastomeric full-faced gasket with a hardness of 50 to 70 durometer A. Neoprene gaskets are commonly available in sizes from 1/2" through to 24" range having a 1/8" thickness. For chemical environments beyond the capabilities of neoprene, more resistant elastomers should be used.

Dimensions

IPEX CPVC flanges are the same as 150lb metal flanges per ANSI B16.1. Threads are tapered iron pipe size threads per ANSI B2.1. The socket dimensions conform to ASTM D2467 which describes 1/2" through 8". Flanges 1/2" to 12" are third party tested by NSF according to ASTM F1970. Flange bolt sets are listed on next page.

Maximum pressure for any flanged system is the rating of the pipe or up to 150psi. Maximum operating pressures for elevated temperatures are shown in the table below.

Blind flanges in sizes 14" - 24" have a maximum working pressure of 50psi.

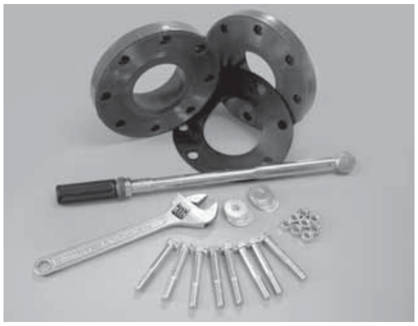
Maximum Pressures for Flanged Systems

Operating Temperature		Max. Operating Pressure (psi)
°F	°C	CPVC
73	23	150
80	27	144
90	32	137
100	38	123
110	43	111
120	49	98
130	54	87
140	60	75
150	66	68
160	71	60
170	77	50
180	82	38
200	93	30
210	99	*

* intermittent drainage only
NR – not recommended

Installation Guidelines

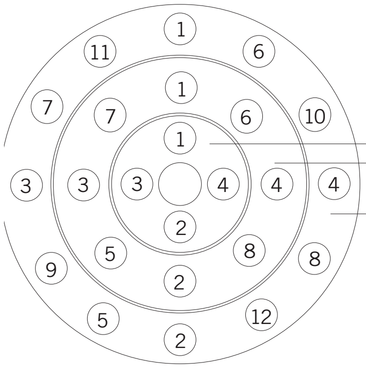
The faces of IPEX flanges have a phonographic-grooved finish providing positive seal on the gasket when the bolts are properly tightened.



Once a flange is joined to pipe, use the following method to join two flanges together:

1. Make sure all bolt holes of the matching flanges are aligned.
2. Insert all bolts.
3. Make sure the faces of the mating flanges are not separated by excessive distance prior to bolting down the flanges.
4. The bolts on the plastic flanges should be tightened by pulling down the nuts diametrically opposite each other using a torque wrench. Complete tightening should be accomplished in stages using the final torque values (see table on next page) Recommended Torque. Uniform stress across the flange will eliminate leaky gaskets.

   The following tightening pattern is suggested for the flange bolts.
5. If the flange is mated to a rigid and stationary flanged object or a metal flange, particularly in a buried situation where settling could occur with the plastic pipe, the plastic flange, and fitting or valve must be supported to eliminate potential stressing.

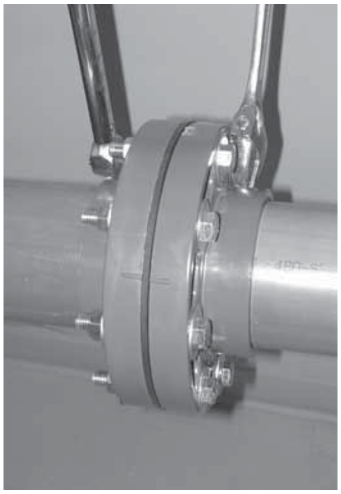


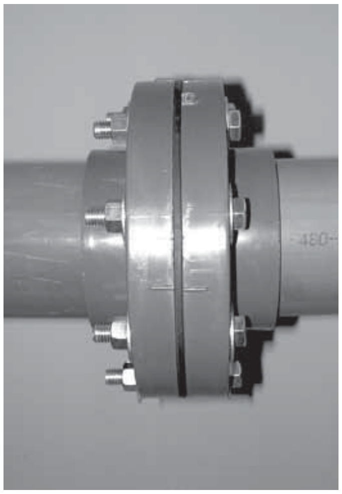
Recommended Torque

Flange Size (in.)	Recommended Maximum Torque (ft. lbs.)*
1/2 – 1-1/2	15
2 – 4	30
6 – 8	50
10	70
12 – 24	100

* Based on using flat-faced CPVC flanges, a full-faced neoprene gasket, and well lubricated hardware, tightened in the proper sequence and applying torque in small increments. For raised-face flange assemblies, and vinyl-to-metal flange (or other materials), these torque recommendations may vary.

Note: When thermoplastic flanges with CPVC rings are used with butterfly valves or other equipment where a full-faced continuous support does not exist, a back-up ring or fiberloc ring should be used to prevent potential cracking of the flange face.





Recommended Flange Bolt Set

Pipe Size	No. of Holes	Bolt Diameter	Bolt Length
1/2	4	0.50	1.75
3/4	4	0.50	2.00
1	4	0.50	2.00
1-1/4	4	0.50	2.25
1-1/2	4	0.50	2.50
2	4	0.63	2.75
2-1/2	4	0.63	3.00
3	4	0.63	3.00
4	8	0.63	3.25
6	8	0.75	3.50
8	8	0.75	4.00
10	12	0.88	5.00
12	12	0.88	5.00
14	12	1.00	7.00
16	16	1.00	7.00
18	16	1.13	8.00
20	20	1.13	9.00
24	20	1.25	9.50

Note: Bolt length may vary depending on the style of flange and use of backing rings.

CAUTION

1. Do not over-torque flange bolts.
2. Use the proper bolt tightening sequence.
3. Make sure the system is in proper alignment.
4. Flanges should not be used to draw piping assemblies together.
5. Flat washers must be used under every nut and bolt head.

testing

Site Pressure Testing

The purpose of an onsite pressure test is to establish that the installed section of line, and in particular all joints and fittings, will withstand the design working pressure, plus a safety margin, without loss of pressure or fluid.

Generally a test pressure of 1-1/2 times the safe working pressure for the pipe installed is adequate. Whenever possible, it is recommended that hydrostatic testing be carried out. It is suggested that the following hydrostatic test procedure be followed after the solvent-welded joints have been allowed to cure for a minimum period of 24 hours at 73ºF (23ºC) (timed from the cure of last joint). For more detail, refer to the joint cure schedules in Table 22 in the Installation section of the IPEX Volume I: Vinyl Process Piping Systems; Industrial Technical Manual Series.

Hydrostatic Test Procedure

1. Fully inspect the installed piping for evidence of mechanical abuse and/or dry suspect joints.
2. Split the system into convenient test sections not exceeding 1,000 ft.
3. Slowly fill the pipe section with water, preferably at a velocity of 1.0 fps or less. Any entrapped air should be evacuated by venting from the high points. Do not pressurize at this stage.
4. Leave the section for at least 1 hour to allow equilibrium temperature to be achieved.
5. Check the system for leaks. If clear, check for and remove any remaining air and increase pressure up to 50 psi. Do not pressurize further at this stage.
6. Leave the section pressurized for 10 minutes. If the pressure decays, inspect for leaks. If the pressure remains constant, slowly increase the hydrostatic pressure to 1-1/2 times the nominal working pressure.
7. Leave the section pressurized for a period not exceeding 1 hour. During this time, the pressure should not change.

If there is a significant drop in static pressure or extended times are required to achieve pressure, either joint leakage has occurred or air remains in the line. Inspect for leakage and if none is apparent, reduce the pressure and check for trapped air. This must be removed before further testing.

Any joint leaks should be repaired and allowed to cure fully before re-pressurizing for a minimum of 24 hours.

WARNING

- NEVER use compressed air or gas in PVC/CPVC/PP/PVDF pipe and fittings.
- NEVER test PVC/CPVC/PP/PVDF pipe and fittings with compressed air or gas, or air-over-water boosters.
- ONLY use PVC/CPVC/PP/PVDF pipe for water and approved chemicals.

Use of compressed air or gas in PVC/CPVC/PP/PVDF pipe and fittings can result in explosive failures and cause severe injury or death.

CPVC is a strong, lightweight material, about one fifth the weight of steel or cast iron. Piping made of this material is easily handled and, as a result, there is a tendency for them to be thrown about on the jobsite. Care should be taken in handling and storage to prevent damage to the pipe.

CPVC pipe should be given adequate support at all times. It should not be stacked in large piles, especially in warm temperature conditions, as bottom pipe may become distorted and joining will become difficult.

For long-term storage, pipe racks should be used, providing continuous support along the length. If this is not possible, timber supports of at least 3" bearing width, at spacings not greater than 3' centers, should be placed beneath the piping. If the stacks are rectangular, twice the spacing at the sides is required. Pipe should not be stored more than seven layers high in racks. If different classes of pipe are kept in the same rack, pipe with the thickest walls should always be at the bottom. Sharp corners on metal racks should be avoided.

For temporary storage in the field when racks are not provided, care should be taken that the ground is level and free of sharp objects (i.e. loose stones, etc.). Pipe should be stacked to reduce movement, but should not exceed three to four layers high.

Most pipe is now supplied in crates. Care should be taken when unloading the crates; avoid using metal slings or wire ropes. Crates may be stacked four high in the field.

The above recommendations are for a temperature of approximately 80°F (27ºC). Stack heights should be reduced if higher temperatures are encountered, or if pipe is nested (i.e. pipe stored inside pipe of a larger diameter). Reduction in height should be proportional to the total weight of the nested pipe, compared with the weight of pipe normally contained in such racks.

Since the soundness of any joint depends on the condition of the pipe end, care should be taken in transit, handling and storage to avoid damage to these ends. The impact resistance and flexibility of CPVC pipe is reduced by lower temperature conditions. The impact strength will decrease as temperatures approach 32°F (0°C) and below. Care should be taken when unloading and handling pipe in cold weather. Dropping pipe from a truck or forklift may cause damage. Methods and techniques normally used in warm weather may not be acceptable at the lower temperature range.

When loading pipe onto vehicles, care should be taken to avoid contact with any sharp corners (i.e. angle irons, nail heads, etc.), as the pipe may be damaged.

While in transit, pipe should be well secured and supported over the entire length and should never project unsecured from the back of a trailer.

Larger pipe may be off-loaded from vehicles by rolling them gently down timbers, ensuring that they do not fall onto one another or onto a hard, uneven surface.

Prolonged Outdoor Exposure

Prolonged exposure of CPVC pipe to the direct rays of the sun will not damage the pipe. However, some mild discoloration may take place in the form of a milky film on the exposed surfaces. This change in color merely indicates that there has been a harmless chemical transformation at the surface of the pipe. A small reduction in impact strength could occur at the discolored surfaces but they are of a very small order and are not enough to cause problems in field installation.

Protection – Covering

Discoloration of the pipe can be avoided by shading it from the direct rays of the sun. This can be accomplished by covering the stockpile or the crated pipe with a light colored opaque material such as canvas. If the pipe is covered, always allow for the circulation of air through the pipe to avoid heat buildup in hot summer weather. Make sure that the pipe is not stored close to sources of heat such as boilers, steam lines, engine exhaust outlets, etc.

Protection – Painting

CPVC pipe and fittings can be easily protected from ultraviolet oxidation by painting with a heavily pigmented, exterior water-based latex paint. The color of the paint is of no particular importance; the pigment merely acts as an ultraviolet screen and prevents sunlight change. White or some other light color is recommended as it helps reduce pipe temperature. The latex paint must be thickly applied as an opaque coating on pipe and fittings that have been well cleaned and very lightly sanded.

Corzan Schedule 40 & 80 CPVC Industrial Pipe & Schedule 80 CPVC Fittings

Scope

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

CPVC Materials

Rigid CPVC (chlorinated polyvinyl chloride) used in the manufacturing of Schedule 40 and 80 pipe complies with the material requirements of ASTM D1784 and has a cell classification of 24448 (23447 from 10" to 16"). Rigid CPVC used in the manufacture of Schedule 80 Fittings shall meet the material requirements of ASTM D1784 and Have a cell classification of 23447 and carry a pressure rating listed by PPI (Plastic Pipe Institute).

Raw material used in the manufacturing 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. The compound must be Corzan grade. The compound must also exhibit a flame spread rating of 10 and a smoke development classification of 25 when tested in accordance with CAN/ULC S102.2.

Dimensions

Physical dimensions and properties of CPVC Schedule 40 and Schedule 80 pipe shall meet or exceed the requirements of ASTM F441.

Physical dimensions and properties of CPVC Schedule 80 fittings – socket type - shall meet the requirements of ASTM F439. Physical dimensions and properties of CPVC Schedule 80 Fittings – threaded type - shall meet the requirements of ASTM F437. Threaded fittings have a taper pipe thread in accordance with ANSI/ASME B1.20.1.

Marking

CPVC Schedule 40 and 80 pipe is marked as prescribed in ASTM F441 and NSF 14. The marking includes the following: IPEX; CORZAN 24448 (23447); IPS CPVC and the schedule and pressure rating at 73ºF (23ºC); ASTM F441; NSF 14; and NSF 61 Potable.

*** 1-1/4" to 2-1/2" Schedule 80 CPVC pipe is third party certified by NSF to CSA B137.6 ***

CPVC Schedule 80 fittings are marked as prescribed in ASTM F437 and F439. The marking includes the following: IPEX; CPVC and the size of the fitting; ASTM F437 or ASTM F439; NSF 14; and NSF 61 potable.

Sample Specification

All CPVC Schedule 80 pipe shall conform to ASTM F441/F441M and be third party certified to NSF 14. All CPVC Schedule 40 and Schedule 80 pipe from 1/2" to 8" shall be made with a CPVC compound having a minimum cell classification of 24448. CPVC Schedule 80 socket fittings shall conform to ASTM F439 and Schedule 80 threaded fittings shall conform to ASTM F437. All fittings must be third party certified to NSF 14.

All CPVC Schedule 40 and 80 pipe and fittings shall be made from a 4000psi HDB PPI rated compound.

All CPVC Schedule 80 fabricated fittings shall be reinforced with fiberglass reinforced plastic (FRP). All CPVC fittings shall be molded or fabricated from CPVC compound that is compatible with the pipe material.

Only IPEX CPVC Schedule 80 pipe shall be threaded and the pressure rating shall be reduced by 50%.

All pipe, fittings and valves shall be compatible, produced using Corzan compound and be produced by one manufacturer as supplied by IPEX.

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- PVC, CPVC, PP, PVDF, PE, ABS, and PEX pipe and fittings

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