

VULCA

PROTHERM CPVC Material, (ACS) approved, Brown Color



CPVC PIPES & FITTINGS

For Hot & Cold Water Distribution and Central Heating Applications

LETTER FROM THE CHAIRMAN

We, at Toutounji Plastic Group, all work together as one team in order to achieve our set goals through efficient time management, communication and planning techniques. Every employee in the company is well aware that their success to accomplish their work in an ethical and productive manner will aid in enabling the company to compete in the market and continue to offer the best quality products along with competitive prices to the local as well as the international market.

Eng. Rafik J. Toutounji





WHO WE ARE

Toutounji Plastic Group is a manufacturing company that was founded in 1972 and has been a leading name in Egypt and the Middle East in its field ever since. The company specializes in the manufacture of thermoplastic sanitary fixtures and bathroom accessories. Its focus is on the injection, blow molding and extrusion of plumbing, pressure water distribution and drainage products for building systems for potable water, in a range of thermoplastic materials and sizes conforming to the international standards and thus meeting the demands of clients around the world. It has two plants in Egypt, located in the heart of El-Obour city's industrial zone in Cairo.

PHILOSOPHY

We do what we do by habit... Excellence is not an act but a habit. Aristotle

Our philosophy is one that centers around the idea that top quality, competitive prices and consistency are essential in insuring that objectives are achieved. The research, development, design and mold-repair/tool-making processes are collectively carried out on our premises along with our R&D department, which is fully equipped with laboratories and specially curated machines.

QUALITY

Our view regarding quality is that it is a crucial factor, which reflects itself as the central focus of our company.

Quality seeks to increase customer satisfaction; therefore it is of primary interest to our management. This notion of quality encompasses not only our product features, which fulfill the customers' requirements, but also those that differentiate our products from our competition. This quality-centered strategy aims at retaining the client, promoting growth and gaining market share.



Our Market

✓ The Right Product

VULCA pipe is the right choice for today's hot and cold water distribution (HCWD) systems. Stringent product quality testing in independent laboratories ensures that VULCA products are of the highest international standards. Combining performance, durability, reliability, safety and cost savings, VULCA pipe is the logical choice over copper, galvanized and alternative plastic systems.

✓ THE QUALITY CHOICE

VULCA products are strong and tough, needing less hangers and supports and have a higher pressure bearing capability than many alternative plastic systems. Oxygen permeation through the pipe wall, and the subsequent corrosion of metal components is eliminated. Heat loss and thermal expansion are reduced. In addition VULCA products do not support combustion, increasing the fire safety of the building.

✓ THE RESULT

Lower installed costs and a plumbing system that will perform throughout the entire life of the building. VULCA CPVC pipe is quieter than metal systems with less water hammer. In addition VULCA offers superior heat retention and virtually eliminates condensation.

✓ NEARLY 50 YEARS OF PERFORMANCE

The reputation of VULCA CPVC pipes and fittings is built on 50 years of flawless performance. Based on the advanced polymer chemistry of AXIALL Protherm, USA, CPVC plumbing systems have proven track record in millions of homes, apartments, hotels and offices. Professional installation with our reliable solvent cement system is your assurance of a worry-free system. The bonding is simple, long lasting and safe; without metal cutting and torches, and no need for expensive tools or an electric source.

✓ EASY, COST EFFECTIVE INSTALLATION

CPVC uses a simple, solvent cement joining method. Tools required are very simple and inexpensive (chamfering tool and pipe cutter only) and avoid the need for an electric source. Installation is easy in tight, confined or inaccessible places. Fittings are also made from CPVC avoiding the need for alternative materials (e.g expensive brass fittings used with some alternative systems). The basic installation procedure is the same as that for PVC known and used by virtually all plumbers.

✓ All you need is:

1. Pipe cutter



2. Chamfering Cone



3. Solvent weld cement cement chemical



✓ The Water Purity Promise

CPVC plumbing systems are approved for contact with potable water in a wide range of countries including USA, Canada, UK, Germany, France and the Netherlands amongst others. VULCA CPVC doesn't break down - even under the harshest of water conditions. So there are none of the purity worries from corrosion of metal pipe or soldered joints. VULCA Keeps pure water pure. Even after years of use in the most aggressive conditions. VULCA CPVC piping won't corrode, standing up to low ph water, coastal salt air exposures and corrosive soils. VULCA CPVC stays as solid and reliable as the day it was installed. It maintains full water-carrying capacity because its scale resistance means no build-up to cause water pressure loss.





Where to use VULCA

VULCA

 CPVC is used for hot and cold water installation systems; CPVC can meet every requirement set for the sanitary sewer mains in the area of buildings (family homes, apartments, hospitals, hotels, commercial buildings). VULCA CPVC installations are approved for the transport of potable water in many countries including France, Canada, UK, Germany, the Netherlands and Japan.

Joining VULCA

 Pipes and Fittings

1- Cutting

VULCA

 pipes can be easily cut with a wheel-type plastic pipe cutter, a hack saw or other fine toothed hand or power saws. Use of ratchet cutters is permitted, provided blades are sharpened regularly. A miter box should be used to ensure a square cut when using a saw. Cutting pipes as square-shaped as possible provides optimal bonding area within the joint. If any indication of damage or cracking is evident at the tube end, cut off at least 5 cm beyond any visible crack.

1

2- Deburring / Beveling

Burrs and fillings can prevent proper contact between tube and fitting during assembly, and should be removed from the outside and inside of the tubing. A chamfering tool is preferred but a pocket-knife or file are suitable for this purpose. A slight bevel on the end of the tubing will ease entry of the tubing into the fitting socket and minimize the chances of pushing solvent cement to the bottom of the joint.



2

3- Fitting Preparation

Wipe any dirt or moisture from the fitting sockets and pipe end. Check the dry fit of the pipe and fitting. The pipe should make contact with the socket wall 1/3 to 2/3 of the way into the fitting socket. At this stage, The pipe should not bottom out in the socket.



3

4 & 5- Primer / Cleaner Application

Primer or cleaner prepares the bonding area for the addition of cement and subsequent assembly. It is important to use a proper applicator. A dauber or natural bristle paint brush approximately 1/2 the size of the tubing diameter is appropriate. Apply primer to both the outside of the tubing end and in the fitting socket. DO NOT ALLOW PRIMER TO PUDDLE IN THE FITTING.



4



5

6 & 7- Solvent Cement Application

USE ONLY CPVC CEMENT OR JOINT FAILURE MAY RESULT. When the primed pipe and fitting surfaces are dry, apply a heavy, even coat of cement on the tubing end. Apply a thin coat inside the fitting socket.



6



7

8- Assembly

Immediately insert the pipe into the fitting socket, rotating the pipe 1/4 to 1/2 turn while inserting. This motion ensures an even distribution of cement within the joint. Properly align the fitting. Hold the assembly for approximately 10 seconds, allowing the joint to set-up. An even bead of cement should be evident around the joint. If this bead is not continuous around the socket edge, it may indicate that insufficient cement was applied. In this case, remake the joint to avoid potential leaks. Wipe excess cement from the tubing and fittings surfaces for an attractive, professional appearance.



8

Set and Cure Times

The drying time of solvent cement is variable depending on the pipe size, humidity and ambient temperature. To ensure the holding of the weld when put under pressure, it is advisable to observe the drying time, as per below. During assembly under conditions of extremely low temperature (-4 °C), do not use frozen solvent cement because it is fatal. Hot weather (+38 °C), we must ensure that the solvent cement is still liquid on both surfaces to be joined.

Minimum Cure Prior to Pressure Testing at 10 Bar

Ambient Temperature During Cure Period	Size of the tubes	
	Up to 32mm	40mm and above
Above 15° C	1 hour	2 hours
4 - 15° C	2 hours	4 hours
Below 4° C	4 hours	8 hours

One - Step Cements

In certain areas, quick-drying, one-step cements are available. These solvent cements do not require the use of a primer and hence steps 4 and 5 of the installation procedure may be eliminated. This solvent cement shortens drying time, as we see in the table below (for temps. > 0 °C).

16 - 32 mm	40 - 63 mm
15 minutes	30 minutes


Tests

Once an installation is done, respecting the recommended drying time. The system should be under pressure of 10 bars for an hour. To perform the test, the network is filled with water (all air bled from the highest and farthest points in the run). In the event of a leak, the joint must be cut and disregarded and replaced with a new section using couplings. In sub-freezing temperatures, water should be blown out after testing to avoid damage to pipes.

Air Testing is NOT Recommended.

Important

Handling and Storage

VULCA  CPVC is a tough, corrosion resistant material, but it does not have the mechanical strength of metal. Reasonable care should be exercised in handling pipes and fittings. They should not be dropped, stepped on, or have objects thrown at them. If improper handling or heavy impact results in cracks, splits or gouges, the damaged items should be discarded.

VULCA  pipes should be covered with a non-transparent material when stored outdoors for long periods of time.

Product Rating & Capabilities

DIMENSIONS

The CPVC plumbing systems meet a wide range of international standards, including **ISO 15877** (PN16, PN20 and PN25). The table on the right shows the dimensions **ISO 15877**.

For sizes other than those described in this table or other references, please contact our technical sales department at the address shown on the back leaf.

Pressure Rating

Pipes, fittings and accessories are designed for continuous use under the following conditions **ISO 15877**.

Hydraulic Design

Hydraulic calculations should be calculated using the Hazen-Williams C value 150.

DIMENSIONS (ISO 15877)

Outside Diameter (mm)	PN 16 (S=6.25)		PN 20 (S=5)		PN 25 (S=4)	
	Thickness (mm)	Weight (kg/m)	Thickness (mm)	Weight (kg/m)	Thickness (mm)	Weight (kg/m)
16	1.2	0.100	1.5	0.118	1.8	0.136
20	1.5	0.151	1.9	0.183	2.3	0.217
25	1.9	0.234	2.3	0.379	2.8	0.326
32	2.4	0.379	3.0	0.455	3.6	0.534
40	3.0	0.582	3.7	0.701	4.5	0.830
50	3.7	0.896	4.6	1.090	5.6	1.290
63	4.7	1.430	5.8	1.720	7.0	2.020
75	5.6	2.020	6.9	2.420	8.4	2.880
90	6.7	2.880	8.2	3.460	10.0	4.100
110	8.2	4.310	10.0	5.130	12.3	6.160

Pressure Rating

Temperature	PN 16 (S = 6.25)	PN 20 (S = 5)	PN 25 (S = 4)
	20°C	16 bar	20 bar
40°C	11 bar	14 bar	17 bar
60°C	8 bar	8 bar	10 bar
80°C	4 bar	4 bar	6 bar



THERMAL EXPANSION

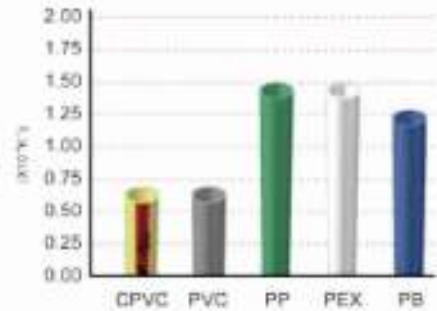
Expansion does not vary with pipe size. The stresses developed in CPVC are generally much smaller than those developed in metal systems for equal temperature changes because of significant differences in the elastic modulus. Therefore, expansion loop requirements are not significantly different than those recommended for copper pipes. Thermal expansion can generally be accommodated at changes in direction and on a long straight run.

VULCA CPVC transition to other materials

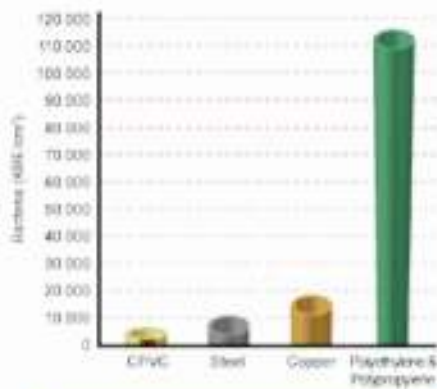
Numerous specialty transitions incorporating rubber seals at the plastic to metal interface are available and should always be used on lines where normal water temperature of 65° C or higher are anticipated. Male CPVC threaded adaptors are also available for connecting valves and apparatus in cold water lines.

TFE (Teflon) thread tape is always safe for making CPVC threaded connections. Some paste-type sealants contain solvents that may be damaging to CPVC. If you prefer to use a paste or pipe dope, always check with the manufacturer regarding its compatibility with CPVC. Use of improper paste or dope can result in failure of the CPVC system.

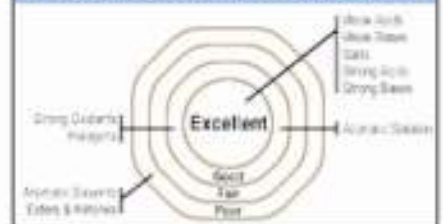
COEFFICIENT of THERMAL EXPANSION



LOW BACTERIAL PROFILERS



Excellent Chemical Resistance



CPVC

PPR OR PEX



This means that the CPVC:

- Needs less hangers and support.
- Suitable for vertical risers.
- There is no unsightly «looping» of the pipe.
- Has a higher pressure bearing capability.

This leads to the same flow rate with a smaller pipe size.

Initially, when the torch is applied.



After the flame is removed, other plastics continue to burn.



Important Low Bacteria Build Up

CPVC piping supports the lowest bacterial growth compared with traditional piping materials. (KINDLY REFER TO OUR TECHNICAL DEPARTEMENT FOR ANY FURTHER DETAILED INFORMATION)

HANGERS AND SUPPORTS

Because VULCA pipes are rigid, they require fewer supports than flexible plastic systems. For vertical runs, provide a support at each floor plus a Mid-story guide. For horizontal runs, provide a support every 90 cm for all diameters up to 32 mm and at 120 cm for larger sized pipes. Pipes should not be anchored tightly to supports, but rather secured with smooth straps or hangers that allow for movement caused by expansion and contraction. Hangers should not have rough or sharp edges which come in contact with the pipes.

FIRE RELATED CONSTRUCTION

Testing demonstrates that VULCA CPVC meets 25/50 flame spread/ smoke developed requirements for installations within plenums. Fire wall penetrations must be sealed with approved materials or devices, such as those listed in the UL Building Materials Directory. Consult your local building official in your region.

Our products can be applied in fire-resistance and light-hazard areas & can be used in such systems like the sprinkler fire-fighting systems instead of black steel as approved by the NFBA under sections 13, 13R & 13D.

<p>CARSO - LABORATOIRE SANTÉ ENVIRONNEMENT HYGIÈNE DE LYON</p> <p>Laboratoire Agréé pour les analyses d'eau par le Ministère de la Santé Laboratoire habilité par le Ministère chargé de la santé en application de l'article R. 1331-62 du code de la santé publique</p> <p>ATTESTATION DE CONFORMITE SANITAIRE (ACS) Certificate of sanitary conformity</p> <p>Conformément à l'arrêté du 29 mai 1967 modifié et aux circulaires du Ministère de la santé DGS/VS4 n° 96217 du 12 avril 1998 et DGS/VS4 n° 2009232 du 27 avril 2009</p> <table border="1"> <tr> <td>Coordonnées du demandeur / Contact details of the ACS owner: TOUTOUNJI PLASTIC GROUP El Obour Industrial Zone Zone A, Street N°193 CARO EGYPTE</td> <td>Nom(s) commercial(aux) du produit fini / Commercial name(s) of the finished product: Tube en PVC-C VULCA</td> </tr> </table> <p>Type de produit fini / Type of finished product: <input checked="" type="checkbox"/> tube / pipe <input type="checkbox"/> produit de jointoyage / sealing product <input type="checkbox"/> autre / other <input type="checkbox"/> joint / seal, gasket, o-ring... <input type="checkbox"/> raccord et machine / fittings <input type="checkbox"/> revêtement / coating <input type="checkbox"/> équipement d'accessoires / accessories component</p> <p>Nature du matériau / Type of material: <input type="checkbox"/> polyéthylène de vinyle PVC <input checked="" type="checkbox"/> PVC renforcé PVC-C <input type="checkbox"/> polyéthylène PE <input type="checkbox"/> polyéthylène téréphtalate PET <input type="checkbox"/> polypropylène PP <input type="checkbox"/> polyéthylène PB <input type="checkbox"/> polyamide PA <input type="checkbox"/> polytrifluoroéthylène PTFE <input type="checkbox"/> acrylonitrile-butadiène-styrène ABS <input type="checkbox"/> polyéthylène-copolymère EPDM <input type="checkbox"/> butadiène-styrène-butadiène BSB <input type="checkbox"/> autre / other <input type="checkbox"/> à base de résine époxydique / epoxy resin</p> <p>Commentaires / Comments: / Coûleur du matériau / material color: maron / brown N° de dossier attribué par le laboratoire habilité / File reference: 17 MAT LY 027</p> <p>Formulation chimique / Chemical formulation: Vérifié par le laboratoire et conforme aux tests positifs Checked by the laboratory and conforms to the positive test</p> <p>Résultats d'essais réalisés selon le norme XP P 41-250 / Migration tests performed according to the standard XP P 41-250: Rapport SVI tests / SVI tested value: 3,60 µg/L Date des essais / Test date: du 10 Février au 22 Mars 2017 / from February 10 to March 02, 2017. Commentaires: Les essais d'écarts réalisés selon les normes AFNOR XP P 41-250-1023 et XP P 41-250-1024 ont été effectués avec succès. Les résultats sont conformes aux exigences de la circulaire DGS/VS4 n° 96-217 du 12 avril 1998. Comments: The migration test carried out according to the standards XP P 41-250-1023 and XP P 41-250-1024 do not bring out any anomaly. The results are in accordance with the requirements of the circular DGS/VS4 n° 96-217 of the 12th of April 1998.</p> <p>Attestation délivrée par / Certificate issued by: A la date du / Date of issue: 21 Mars 2017 Date d'expiration de l'ACS / Expiry date: 21 Mars 2022 Commentaires / Comments: /</p> <p>F. MOUSSA - MARIEM EL MARI Responsable MCOE CARSO - L.S.E.H.L.</p>	Coordonnées du demandeur / Contact details of the ACS owner: TOUTOUNJI PLASTIC GROUP El Obour Industrial Zone Zone A, Street N°193 CARO EGYPTE	Nom(s) commercial(aux) du produit fini / Commercial name(s) of the finished product: Tube en PVC-C VULCA	<p>CARSO - LABORATOIRE SANTÉ ENVIRONNEMENT HYGIÈNE DE LYON</p> <p>Laboratoire Agréé pour les analyses d'eau par le Ministère de la Santé Laboratoire habilité par le Ministère chargé de la santé en application de l'article R. 1331-62 du code de la santé publique</p> <p>ATTESTATION DE CONFORMITE SANITAIRE (ACS) Certificate of sanitary conformity</p> <p>Conformément à l'arrêté du 29 mai 1967 modifié et aux circulaires du Ministère de la santé DGS/VS4 n° 96217 du 12 avril 1998 et DGS/VS4 n° 2009232 du 27 avril 2009</p> <table border="1"> <tr> <td>Coordonnées du demandeur / Contact details of the ACS owner: TOUTOUNJI PLASTIC GROUP El Obour Industrial Zone Zone A, Street N°193 CARO EGYPTE</td> <td>Nom(s) commercial(aux) du produit fini / Commercial name(s) of the finished product: Raccord en PVC-C VULCA</td> </tr> </table> <p>Type de produit fini / Type of finished product: <input type="checkbox"/> tube / pipe <input type="checkbox"/> produit de jointoyage / sealing product <input type="checkbox"/> autre / other <input checked="" type="checkbox"/> joint / seal, gasket, o-ring... <input type="checkbox"/> raccord et machine / fittings <input type="checkbox"/> revêtement / coating <input type="checkbox"/> équipement d'accessoires / accessories component</p> <p>Nature du matériau / Type of material: <input type="checkbox"/> polyéthylène de vinyle PVC <input type="checkbox"/> PVC renforcé PVC-C <input type="checkbox"/> polyéthylène PE <input type="checkbox"/> polyéthylène téréphtalate PET <input type="checkbox"/> polypropylène PP <input type="checkbox"/> polyéthylène PB <input type="checkbox"/> polyamide PA <input type="checkbox"/> polytrifluoroéthylène PTFE <input type="checkbox"/> acrylonitrile-butadiène-styrène ABS <input type="checkbox"/> polyéthylène-copolymère EPDM <input type="checkbox"/> butadiène-styrène-butadiène BSB <input type="checkbox"/> autre / other <input type="checkbox"/> à base de résine époxydique / epoxy resin</p> <p>Commentaires / Comments: / Coûleur du matériau / material color: maron / brown N° de dossier attribué par le laboratoire habilité / File reference: 17 MAT LY 028</p> <p>Formulation chimique / Chemical formulation: Vérifié par le laboratoire et conforme aux tests positifs Checked by the laboratory and conforms to the positive test</p> <p>Résultats d'essais réalisés selon le norme XP P 41-250 / Migration tests performed according to the standard XP P 41-250: Rapport SVI tests / SVI tested value: 3,00 µg/L Date des essais / Test date: du 10 Février au 07 Avril 2017 / from February 10 to April 07, 2017. Commentaires: Les essais d'écarts réalisés selon les normes AFNOR XP P 41-250-1023 et XP P 41-250-1024 ont été effectués avec succès. Les résultats sont conformes aux exigences de la circulaire DGS/VS4 n° 96-217 du 12 avril 1998. Comments: The migration test carried out according to the standards XP P 41-250-1023 and XP P 41-250-1024 do not bring out any anomaly. The results are in accordance with the requirements of the circular DGS/VS4 n° 96-217 of the 12th of April 1998.</p> <p>Attestation délivrée par / Certificate issued by: A la date du / Date of issue: 30 Avril 2017 Date d'expiration de l'ACS / Expiry date: 30 Avril 2022 Commentaires / Comments: /</p> <p>F. MOUSSA - MARIEM EL MARI Responsable MCOE CARSO - L.S.E.H.L.</p>	Coordonnées du demandeur / Contact details of the ACS owner: TOUTOUNJI PLASTIC GROUP El Obour Industrial Zone Zone A, Street N°193 CARO EGYPTE	Nom(s) commercial(aux) du produit fini / Commercial name(s) of the finished product: Raccord en PVC-C VULCA
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<p>Certificate 1002716</p> <p>The registered owner of</p> <p>El Toutounji Plastic Group El Obour Industrial Zone P.O. Box 19322 Cairo, Egypt</p> <p>The following activities:</p> <p>Manufacturing of ECOTUBE CPVC pipes and fittings, PVC pipes and fittings for potable water distribution systems as well as plastic and metallic bathroom accessories and fixtures</p> <p>This certificate is valid from 27 December 2016 until 18 September 2022 and remains valid subject to satisfactory surveillance audits. Its certification ends on 15 August 2018. Issue 1. Certified since 19 December 2010.</p> <p>SGS</p> <p>UKAS MANAGEMENT SYSTEMS</p> <p>Page 1 of 1</p>	<p>September 14, 2016</p> <p>To Whom It May Concern:</p> <p>Axial Corporation LLC, a leading manufacturer of CPVC extrusion and injection grade compounds, with headquarters in Atlanta, Georgia, USA, certify that we are selling our ACS approved CPVC compounds to Toutounji Plastic Group. They are authorized to use our Proforma trademark on their pipes, certifying they are made from 100% Axial compounds.</p> <p>We also certify that our Indian Joint Venture SHIRAM AXGALL is manufacturing ACS approved compounds and supplying these to Toutounji Plastic.</p> <p>Kevin E. BIRDA International General Manager PVC & CPVC Compounds Axial Corporation LLC, a Westlake company</p>				



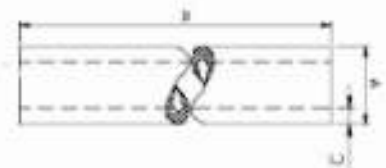
VULCA 



CPVC Pressure Pipes and Fittings.



CPVC - Pipes



Pipes - PN 16

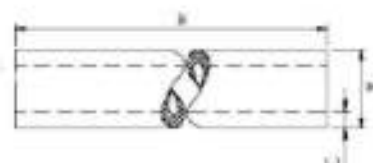
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3396041102315	20	1.50	4 m	16	280
3396041102322	25	1.90	4 m	16	200
3396041102329	32	2.40	4 m	16	120
3396041102336	40	3.00	4 m	16	80
3396041102343	50	3.70	4 m	16	60
3396041102350	63	4.70	4 m	16	40
3396041102357	75	5.60	4 m	16	20
3396041102364	90	6.70	4 m	16	20
3396041102371	110	8.20	4 m	16	12

Pipes - PN 20

CODE	DIAMETER(D)	THICKNESS (T)	LENGTH (L)	PN	PACKAGING/M
3396041102245	16	1.50	4 m	20	400
3396041102252	20	1.90	4 m	20	280
3396041102259	25	2.30	4 m	20	200
3396041102266	32	3.00	4 m	20	120
3396041102273	40	3.70	4 m	20	80
3396041102280	50	4.60	4 m	20	60
3396041102287	63	5.80	4 m	20	40
3396041102294	75	6.90	4 m	20	20
3396041102301	90	8.20	4 m	20	20
3396041102308	110	10.00	4 m	20	12



VULCA



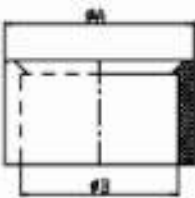
Pipes - PN 25

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3396041102183	16	1.80	4 m	25	400
3396041102184	20	2.30	4 m	25	280
3396041102191	25	2.80	4 m	25	200
3396041102207	32	3.60	4 m	25	120
3396041102214	40	4.50	4 m	25	80
3396041102221	50	5.60	4 m	25	60
3396041102238	63	7.00	4 m	25	40

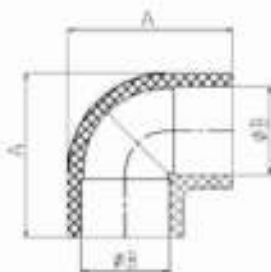
Coupler



CODE	DIAMETER(D)	PN	PACKAGING
3396041101124	16	25	900
3396041101125	20	25	525
3396041101132	25	25	300
3396041101149	32	25	175
3396041101156	40	25	225
3396041101163	50	25	160
3396041101170	63	25	100
3396041101171	75	25	60
3396041101172	90	25	36
3396041101173	110	25	24

REDUCING BUSH


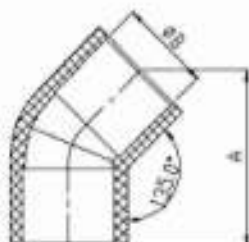
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3396041101383	20/16	25	2500
3396041101384	25/16	25	1200
3396041101385	25/20	25	1200
3396041101391	32/20	25	600
3396041101392	32/25	25	600
3396041101407	40/25	25	1000
3396041101408	40/32	25	1000
3396041101414	50/32	25	450
3396041101415	50/40	25	450
3396041101421	63/40	25	250
3396041101422	63/50	25	250
3396041101428	75/50	25	180
3396041101429	75/63	25	180
3396041101436	90/75	25	90
3396041101443	110/90	25	72

ELBOW 90°


CODE	D	PN	PACKAGING
3396041101001	16	25	500
3396041101002	20	25	400
3396041101019	25	25	210
3396041101026	32	25	120
3396041101033	40	25	150
3396041101040	50	25	100
3396041101057	63	25	54
3396041101058	75	25	32
3396041101059	90	25	20
3396041101060	110	25	12

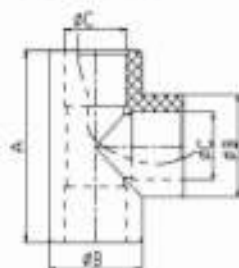


ELBOW 45°



CODE	D	PN	PACKAGING
3396041101063	16	25	500
3396041101064	20	25	450
3396041101071	25	25	240
3396041101088	32	25	150
3396041101095	40	25	195
3396041101101	50	25	120
3396041101118	63	25	75
3396041101119	75	25	45
3396041101120	90	25	25
3396041101121	110	25	16

TEE 90°



CODE	D	PN	PACKAGING
3396041101186	16	25	320
3396041101187	20	25	240
3396041101194	25	25	140
3396041101200	32	25	80
3396041101217	40	25	120
3396041101224	50	25	80
3396041101231	63	25	40
3396041101232	75	25	24
3396041101233	90	25	15
3396041101234	110	25	8

STEP - OVER BEND



CODE	D	PN	PACKAGING
3396041102388	16	25	160
3396041102395	20	25	120
3396041102402	25	25	72


Mono D' Clips (MDC)

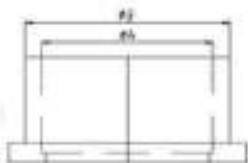
CODE	D	PACKAGING
3396041101439	20	700
3396041101446	25	560
3396041101453	32	400


UNION COUPLER

CODE	D	PN	PACKAGING
3396041102122	20	25	240
3396041102139	25	25	120
3396041102146	32	25	80
3396041102153	40	25	120
3396041102160	50	25	100
3396041102177	63	25	60


FLANGE

CODE	D	PN	PACKAGING
3396041102419	63	25	30
3396041102426	75	25	70
3396041102433	90	25	60
3396041102440	110	25	40

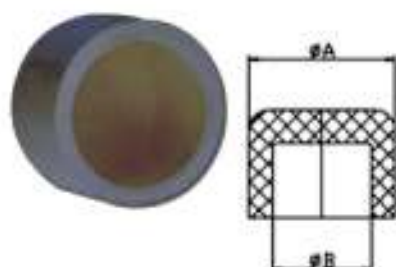

COUPLER FOR FLANGE

CODE	D	PN	PACKAGING
3396041102457	63	25	60
3396041102465	75	25	108
3396041102472	90	25	60
3396041102489	110	25	36





END CAP



CODE	D	PN	PACKAGING
3396041101459	16	25	800
3396041101460	20	25	600
3396041101477	25	25	450
3396041101484	32	25	240
3396041101491	40	25	450
3396041101507	50	25	200
3396041101514	63	25	128

PLASTIC THREADED MALE ADAPTOR



CODE	D	SIZE	PN	PACKAGING
3396041102015	20	20 x 1/2"	25	480
3396041102016	25	25 x 3/4"	25	300
3396041102023	32	32 x 1"	25	175
3396041102030	40	40 x 1 1/4"	25	300
3396041102047	50	50 x 1 1/2"	25	200
3396041102054	63	63 x 2"	25	120

THREADED REDUCER PLASTIC



CODE	D	SIZE	PN	PACKAGING
3396041102496	25	25 x 1/2"	25	800

MALE ADAPTOR + GUN METAL



CODE	D	SIZE	PN	PACKAGING
3396041101617	16	16 x 3/8"	25	240
3396041101618	16	16 x 1/2"	25	240
3396041101619	20	20 x 3/8"	25	180
3396041101620	20	20 x 1/2"	25	180
3396041101636	25	25 x 1/2"	25	175
3396041101637	25	25 x 3/4"	25	160
3396041101644	32	32 x 1"	25	120
3396041101651	40	40 x 1 1/4"	25	60
3396041101668	50	50 x 1 1/2"	25	48
3396041101675	63	63 x 2"	25	24


FEMALE ADAPTOR + GUN METAL

CODE	D	SIZE	PN	PACKAGING
3396041101617	16	16 x 3/8"	25	400
3396041101618	16	16 x 1/2"	25	400
3396041101619	20	20 x 3/8"	25	350
3396041101620	20	20 x 1/2"	25	350
3396041101636	25	25 x 1/2"	25	150
3396041101637	25	25 x 3/4"	25	150
3396041101644	32	32 x 1"	25	120
3396041101651	40	40 x 1 1/4"	25	60
3396041101668	50	50 x 1 1/2"	25	48
3396041101668	63	63 x 2"	25	24

FEMALE PLASTIC ADAPTOR

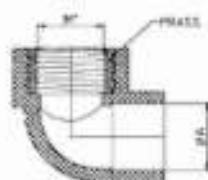

CODE	D	SIZE	PN	PACKAGING
3396041102503	20	20X1/2"	25	400
3396041102510	25	25X3/4"	25	240
3396041102527	32	32X1"	25	140
3396041102534	40	40X1 1/4"	25	90

ELBOW 90°+GUN METAL INSERT MALE THREADING


CODE	D	SIZE	PN	PACKAGING
3396041102541	16	16X3/8"	25	300
3396041102558	16	16X1/2"	25	240
3396041102565	20	20X3/8"	25	250
3396041102572	20	20X1/2"	25	240
3396041102589	25	25X1/2"	25	150
3396041102596	25	25X3/4"	25	150
3396041102603	32	32x1/2"	25	60
3396041102610	32	32x3/4"	25	60
3396041102627	32	32*1"	25	60


ELBOW 90°PLASTIC THREADING

3396041102634	20	20 x 1/2"	25	180
3396041102641	25	25 x 3/4"	25	150



ELBOW 90°+GUN METAL INSERT FEMALE THREADING

CODE	D	SIZE	PN	PACKAGING
3396041101907	16	16X3/8"	25	280
3396041101908	16	16X1/2"	25	280
3396041101909	20	20X3/8"	25	240
3396041101910	20	20X1/2"	25	240
3396041101926	25	25X1/2"	25	150
3396041101927	25	25X3/4"	25	150
3396041101932	32	32x1/2"	25	80
3396041101933	32	32x3/4"	25	80
3396041101934	32	32*1"	25	80

MALE BRASS COUPLER ADAPTOR WITH CPVC END



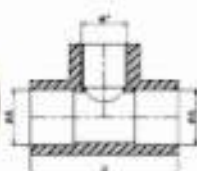
CODE	D	SIZE	PN	PACKAGING
3396041101682	20	20X1/2"	25	150
3396041101699	25	25X3/4"	25	120
3396041101705	32	32X1"	25	60
3396041101712	40	40X1 1/4"	25	35
3396041101729	50	50X1 1/2"	25	24
3396041101736	63	63X2"	25	20
3396041101737	75	75X2 1/2"	25	12
3396041101738	90	90X3"	25	6

FEMALE BRASS COUPLER ADAPTOR WITH CPVC END

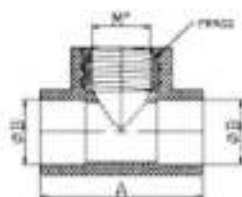


CODE	D	SIZE	PN	PACKAGING
3396041101859	20	20X1/2"	25	100
3396041101866	25	25X3/4"	25	50
3396041101873	32	32X1"	25	40
3396041101880	40	40X1 1/4"	25	30
3396041101897	50	50X1 1/2"	25	25
3396041101903	63	63X2"	25	20
3396041101904	75	75X2 1/2"	25	12
3396041101905	90	90X3"	25	8

FEMALE PLASTIC THREADED TEE



CODE	D	SIZE	PN	PACKAGING
3396041102061	20	25X1/2"	25	120
3396041102078	25	25X3/4"	25	120

TEE + GUN METAL INSERT FEMALE THREADING


CODE	D	SIZE	PN	PACKAGING
3396041101576	16	16X3/8"	25	250
3396041101577	16	16X1/2"	25	250
3396041101578	20	20X3/8"	25	180
3396041101579	20	20X1/2"	25	180
3396041101580	25	25X1/2"	25	90
3396041101581	25	25X3/4"	25	90
3396041101582	32	32x1/2"	25	60
3396041101583	32	32x3/4"	25	60
3396041101584	32	32x1"	25	60

CONCEALED VALVE (T)


CODE	D	PN	PACKAGING
3396041102700	20	25	30
3396041102707	25	25	30

EXTERNAL VALVE (Y)


CODE	D	PN	PACKAGING
3396041102800	25	25	30
3396041102807	32	25	25


 CPVC SOLVENT CEMENT
 WELDING CHEMICAL


Our new design of VULCA adaptors can be made to transform any plastic fitting into a transition brass one. This demonstrates the versatility of our system.



Product Technical Specifications



PROTHERM CPVC Material, ACS approved, Brown Color
Information on Physical and Chemical Properties

Material Description

Physical Form	Solid	Appearance/Description	Pellet of varying size, harness, and color with a potential slight odor.
Color	Various colors.	Odor	Potential slight odor.
Odor Threshold	No data available		

General Properties

Boiling Point	No data available	Melting Point/Freezing Point	No data available
Decomposition Temperature	Temperature of 300°F (150°C) or greater over an extended period of time may cause thermal degradation of CPVC resin		No data available
Specific Gravity/Relative Density	1.15 to 1.7 Water=1	Water Solubility	Insoluble
Viscosity	No data available	Explosive Properties	No data available
Oxidizing Properties:	No data available		

Volatility

Vapor Pressure	< 1 mmHg (torr)	Vapor Density	No data available
Evaporation Rate	No data available		

Flammability

Flash Point	> 600 F(> 315.5556 C)	UEL	No data available
LEL	No data available	Autoignition	No data available
Flammability (solid, gas)	No data available		

Environmental

Octanol/Water Partition coefficient	No data available		
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Classification of service conditions

Example of application	Claes	T°		T _{max}		T _m	
		°C	time years	°C	time years	°C	time years
Hot water supply (60°C)	1	60	49	80	1	95	100
Hot water supply (70°C)	2	70	49	80	1	95	100
Low-temperature underfloor heating	3	30	20	50	4.5	65	100
		40	25				
Underfloor heating and low-temperature radiators	4	40	20	70	2.5	100	100
		60	25				
High-temperature radiators	5	60	25	90	1	100	100
		80	10				



CPVC	PPR
OD = 16 mm t = 1.5 mm ID = 13.0 mm Weight = 0.118 kg/m	OD = 20 mm t = 3.4 mm ID = 13.2 mm Weight = 0.172 kg/m
OD = 20 mm t = 1.9 mm ID = 16.2 mm Weight = 0.183 kg/m	OD = 25 mm t = 4.2 mm ID = 16.6 mm Weight = 0.266 kg/m
OD = 25 mm t = 2.3 mm ID = 20.4 mm Weight = 0.279 kg/m	OD = 32 mm t = 5.4 mm ID = 21.2 mm Weight = 0.434 kg/m

The same flow rate (as measured by internal Diameter) may be achieved with a smaller pipe Size (see table below)

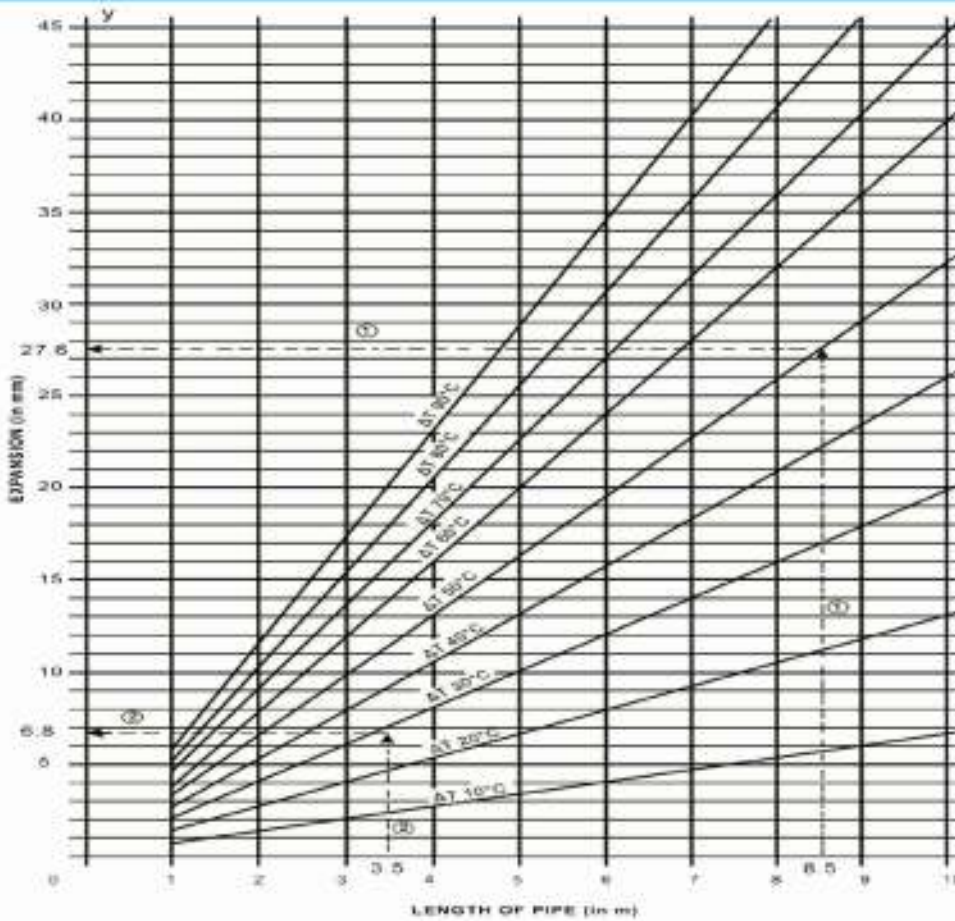
Outside Diameter (mm)	Different Materials Properties			
	CPVC	PPR	PEX	PB
20	1.9	3.4	2.8	2.3
25	2.3	4.2	3.5	2.8
32	3.0	5.4	4.4	3.6
40	3.7	6.7	5.5	4.5
50	4.6	8.4	6.9	5.6

Different Materials Properties

	CPVC	PVC	PPR	PEX	PB	CU
Tensile Strength (MPa at 23°C)	55	50	30	25	27	>300
Coefficient of Thermal Expansion (x10 ⁻⁴ K ⁻¹)	0.7	0.7	1.5	1.5	1.3	0.2
Thermal Conductivity (W/MK)	0.14	0.14	0.22	0.22	0.22	>400
LOI	60	45	18	17	18	
Oxygen Permeation (cm ³ /m. day.atmosphere)(at 70°C)	<1 (Insignificant)	(Not available similar to CPVC)	(Not available similar to PB/PEX)	13	16	(Not available Insignificant)
VICAT softening temp.°C	118	75	105	105		



Expansion - Contraction Phenomeneon - Calculations



Industrial Chemical Resistance Chart

← LESS EXPENSIVE ————— MOST EXPENSIVE →

	PE	PVC	UP	Corros. EPVC	Corros. HDPE	PP	High-Density PE	PFA	HDPE	PPS	PTFE	Acrylic
Acetic Acid	B	C	S	X	X	A	C	A	A	A	A	A
Aluminium Chloride	A	A	A	A	C	X	A	A	B	B	A	A
Aluminium Sulfate	A	A	A	A	C	C	A	A	B	A	B	B
Ammonium Chloride	A	A	A	A	X	C	A	A	B	A	A	A
Ammonium hydroxide, 10%	A	A	A	X	-	A	A	A	A	A	A	A
Ammonium sulfate	A	A	A	A	X	-	A	A	B	A	A	A
Chlorine gas, wet	X	X	X	X	-	C	A	A	X	A	A	A
Chlorine water	C	A	X	A	-	X	A	B	X	A	A	A
Chromic acid	B	A	X	A	X	C	C	A	C	A	B	A
Capric Chloride	A	A	A	A	X	C	A	A	X	A	B	A
Ferric Chloride	A	A	A	A	X	X	A	A	X	A	C	A
Ferric Sulfate	A	A	A	A	X	C	A	A	X	A	A	A
Hydrochloric acid, 10%	B	A	A	A	X	X	A	A	A	X	A	A
Hydrochloric acid, 20%	B	A	A	A	X	X	A	A	C	X	B	A
Hydrochloric acid, 36%	B	A	C	A	X	X	C	A	X	X	B	A
Hydrofluoric acid	B	C	X	A	X	X	X	A	A	X	A	A
Isopropylal	A	B	B	C	A	A	A	A	A	A	A	A
Mercuric Chloride	A	A	A	A	X	X	A	A	X	A	C	A
Methyl ethyl ketone	C	X	X	X	A	A	X	X	A	A	A	A
Mineral oil	A	A	A	A	A	A	A	A	A	A	A	A
Nitric Acid	C	B	X	B	X	X	B	A	X	A	A	A
Nitrous Acid	C	A	-	A	X	X	A	A	X	-	-	-
Phosphoric acid	A	A	B	A	X	B	A	A	C	B	A	A
Potassium Hydroxide	A	A	A	A	C	B	A	C	A	C	B	A
Silver Nitrate	A	A	A	A	E	B	A	A	X	A	A	A
Sodium Hydroxide	A	A	A	A	B	B	A	X	A	X	B	A
Sodium Hypochlorite	A	A	C	A	X	C	A	C	X	C	B	A
Sulfur Chloride	A	A	A	A	X	X	A	A	X	A	C	A
Sulfur Chloride, dry	A	A	X	A	X	-	A	C	A	C	B	A
Sulfur dioxide, wet	A	B	S	A	X	A	A	A	X	C	A	A
Sulfuric acid, 60%	C	C	X	A	X	X	X	A	A	X	B	A
Sulfuric acid, 90%	C	C	X	B	X	X	X	A	X	X	B	A
Sulfuric acid	A	A	A	A	X	C	A	A	X	A	B	A
Toluene	X	X	X	X	A	A	X	B	A	A	A	A
Zinc Chloride	A	A	A	A	X	B	A	A	H	A	B	A

*Data based on the Standard Pipe Institute, Inc. (SPI) 60 pipe rating

Legend:
 A — recommended within the operating specifications of the pipe
 B — somewhat limited with respect to concentration and/or temperature
 C — quite limited with respect to concentration and/or temperature
 X — not recommended





PN20 Pipe Permissible Working Pressures (bar)


Temperature (°C)	Design service life	Safety Factor =1.25	Safety Factor =1.5	Safety Factor =2.0	Safety Factor =2.5
20	10 yrs	42.8	35.7	26.8	21.4
	25 yrs	41.2	34.3	25.7	20.6
	50 yrs	40.0	33.3	25.0	20.0
40	10 yrs	31.0	25.8	18.6	15.5
	25 yrs	29.6	24.7	17.8	14.8
	50 yrs	28.4	23.7	17.0	14.2
60	10 yrs	19.6	16.3	11.8	9.8
	25 yrs	18.4	15.3	11.0	9.2
	50 yrs	17.6	14.7	10.6	8.8
70	10 yrs	14.4	12.0	8.6	7.2
	25 yrs	13.4	11.2	8.0	6.7
	50 yrs	12.8	10.7	7.7	6.4
80	1 yr	12.0	10.0	7.2	6.0
	5 yrs	10.4	8.7	6.2	5.2
	10 yrs	9.8	8.2	5.9	4.9
	25 yrs	9.0	7.5	5.4	4.5
	50 yrs	8.4	7.0	5.0	4.2
90	5 days	11.8	9.8	7.1	5.9
	30 days	9.8	8.2	5.9	4.9
	60 days	9.2	7.7	5.5	4.6
	90 days	8.8	7.3	5.3	4.4
	1 yr	7.6	6.3	4.6	3.8
	5 yrs	6.4	5.3	3.8	3.2
	10 yrs	6.0	5.0	3.6	3.0
	25 yrs	5.4	4.5	3.2	2.7
	50 yrs	5.0	4.2	3.0	2.5
	95	5 days	9.2	7.7	5.5
30 days		7.6	6.3	4.6	3.8
60 days		7.0	5.8	4.2	3.5
90 days		6.6	5.5	4.0	3.3
1 yr		5.8	4.8	3.5	2.9
5 yrs		4.8	4.0	2.9	2.4
10 yrs		4.4	3.7	2.6	2.2
25 yrs		4.0	3.3	2.4	2.0
50 yrs		3.6	3.0	2.2	1.8

Frequently asked questions about VULCA CPVC

1. Where should I use VULCA CPVC ?

VULCA  CPVC is designed for use in hot and cold water distribution systems. VULCA  CPVC systems are ideal for all potable water needs of piping in a typical single-family home, apartment, motel, condominium, mobile homes, manufactured homes, light commercial and institutional structures. Other applications of hot water piping as central heating, radiant floor heating and solar energy can be adapted to CPVC. However, please check with the manufacturer of the heating unit before using CPVC in these applications.

2. What is the expected life of a water distribution system CPVC?

CPVC piping systems have been installed and operating since 1960 and these facilities are still performing flawlessly for more than 40 years. VULCA  CPVC system design and standards incorporate significant engineering safety factors which lead to a long service life. CPVC piping is not susceptible to corrosion. Electrolysis or scale buildup in areas where water, soil and / or weather conditions are aggressive. We firmly believe that CPVC plumbing systems will provide a service life as long as or longer than other materials on the market.

3. Will a VULCA CPVC system provide a financial benefit to the owners in terms of utilities expense?

Yes. The thermal conductivity of a metal is 2500 times greater than that of a CPVC system. The improved insulating characteristics associated with CPVC can generate long-term savings for a home energy-conscious owner or tenant. CPVC will keep water hot for a much longer period than metal tubing.

4. How can I use CPVC if I run under a concrete slab?

When using CPVC under slab, you must pressure test the system before pouring the slab. In addition, it is wise to use a 1" foam insulating pipe at changes in direction, where the pipe emerges from the slab, and at construction joints, the pipe should also be supported in smooth bottom trenches, the backfill of which would be free of rock and debris which could damage the pipe.

5. Should specific types of primers and solvent cements be used on a CPVC system? Are specific colors required?

Solvent cement used should always be for CPVC use specifically, and manufactured to meet the requirements of ISO 15877 or equivalent. All-purpose cements should not be used. Purple primer manufactured for PVC pipe is acceptable. Orange CPVC solvent cements facilitate identification. De-pigmented CPVC solvent cement and primers are available and are acceptable in various jurisdictions. Clear cement / primer provide a neater finished appearance.



6. I was told that CPVC pipe ends may split during installation. Why should it occur? How can these cracks be prevented?

Most cracks are initiated by rough handling, this handling can occur during shipment, while being inventoried at the wholesaler, or while on the job site. In addition, fine cracks can be caused by cutting the pipe with dull or damaged ratchet cutters, or using ratchet cutters when temperatures are below 10 ° C. The vast majority of cracks occur during the colder months. When ambient temperatures are below 10 ° C, CPVC, like most other plastics such as PP, PE, PVC-U, may become somewhat brittle and must be handled more carefully. To reduce problems resulting from cracked product, several measures can be initiated:

- Educate your installers. Make them aware of the potential problem and instruct them to handle CPVC in an appropriate way.
- Use a saw or a circular pipe cutter with a plastic cutting blade (serrated # 151P or similar) to cut your pipe to length.
- Inspect pipe ends thoroughly before making a joint. If a crack is evident, cut off any split portion before proceeding.
- In cold weather, gripping the pipe tightly around the cutting area for about 10 seconds before making the cut will warm the pipe and reduce potential problems.

7. What about CPVC piping in the walls?

CPVC can be embedded within walls, provided that the following points are respected:

- Embed firmly in the wall, with the piping contained continuously with concrete. (The other alternative is to allow the pipe to move freely under thermal expansion. Problems will occur if the pipe is neither completely embedded nor able to expand freely) concrete should be homogeneous, without gravel or stones which risk damaging the pipe. Ensure that the pipe is at least 2.5 cm from the outside surface.
- Do not embed demountable fittings.
- At exit and entry points, protect pipes with a sleeve.
- Pressure testing must be done before concrete is poured.

As the pipe thermally expands, tensile stresses will be developed. Concrete will contain the CPVC; other materials may not, eg: plasterboard. The developed tensile stress, α , is given by the equation:

$$\alpha = C \cdot \Delta T \cdot E$$

C = Coefficient of thermal expansion

ΔT = temperature change

E = Youngs module

This calculated developed tensile stress may be compared to the surrounding material (plasterboard, concrete, etc.) to give an indication whether the material will contain the pipe, or whether the pipe will crack the wall.

for CPVC

$$C = 6.3 \times 10^{-5} \text{ cm/cm}^\circ\text{C}$$

$$E = 2650 \text{ MPa}$$

8. Is CPVC resistant to U.V. exposure?

If we compare CPVC to some other commonly used piping materials.

Polyethylene and polypropylene:

U.V. acts as a powerful catalyst for the oxidation process that breaks the polymer chains, leading to weakness in the pipe and loss of hydrostatic strength.

CPVC :

The main process of degradation is dehydrochlorination, while slightly accelerated by U.V., it does not break the polymer chains significantly after outdoor exposure, being mainly limited to a surface discoloration. There is a loss of impact resistance due to the impact modifiers losing efficiency. *This may even result in increased modulus.*

- There is no significant loss of stress bearing capability.
- 30 years of outside service in southern California.
- Impact resistance mainly an installation issue (before exposure to UV).

If a portion of the piping system will be left exposed to U.V. light, a standard grade of exterior latex paint will adequately protect the pipe.

9. Is CPVC quieter than a metallic system?

Yes, we can compare the velocity of sound in CPVC to that in copper and water. The velocity of sound in:

CPVC = 1350m/s

Copper = 3600m/s

Water = 1473m/s

The sound will travel in the material with the fastest possible velocity. This means that in a copper system, the sound travels in the copper, whilst in a CPVC system, sound travels in the water and the system is as quiet as physically possible.

10. What about scale build up?

Scale build up is a function of roughness of the pipe, as measured by the Hazen-Williams «C» factor used in the formula for calculating friction head losses in piping systems.

Increased value for C ► Less friction
Less pressure drop

material	C Factor	
	NEW	After 4-40 years service
CPVC	150	150
COPPER/STEEL	130-140	60-120

With metal systems, once corrosion attack starts, (eg: the green color when copper reacts with chlorides in water to form copper chloride) this starts a vicious circle leading to scale build up. With CPVC, there is no corrosion and hence scale build up is inhibited.

11. Is condensation reduced with CPVC?

Yes, for a given ambient air temperature and water temperature in the pipe, the relative humidity must be 10-15% higher with CPVC to get the same degree of condensation; for the same humidity level and water temperature can be $\pm 10^{\circ}\text{C}$ higher than for copper to get the same degree of condensation.



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