Cosmoplast®

uPVC Pipes and Fittings

for High Pressure, Drainage and Ducting Applications (Metric & Imperial Sizes)

BSEN 1452

WRAS Water Regulations Advisory Scheme

NSF

*Please refer to certificates for details

Cosmoplast

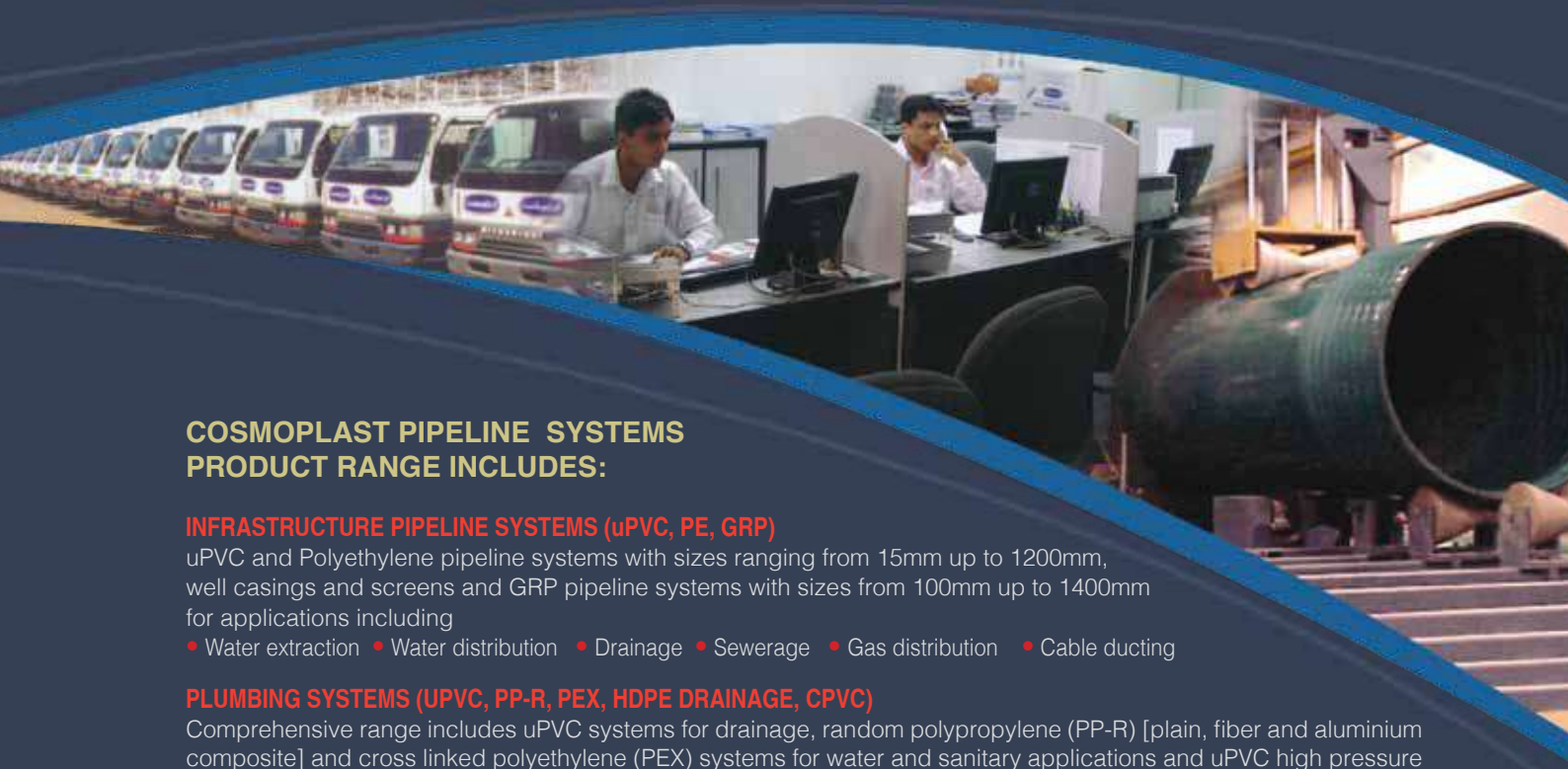
Cosmoplast, a primary member of Group Harwal, has been at the forefront of the plastic industry in the Gulf region since it's founding in 1976. Through constant growth and product diversification, the company continues to be the largest thermoplastic pipe manufacturer in the region.

Continuously enhancing its capabilities in plastic manufacturing technologies, Cosmoplast now utilizes a diverse range of materials such as uPVC, polyethylene (PE100, PE 80, LLDPE), cross linked polyethylene (PEX), random copolymer polypropylene (PP-R), and Glass-Reinforced Plastic (GRP), CPVC & RTP.

Cosmoplast's ongoing research and development programs continue to add new products to its pipeline systems product range that now includes pre-insulated pipes, reinforced thermoplastic pipes, specialized plumbing systems and fabricated uPVC and GRP manhole systems. It's state of the art engineering,design and tool room facilities are fully capable of manufacturing moulds, dies, machinery equipments and other specialized tooling requirements to meet the company's continual expansion and product development requirements.

With this extended product range, Cosmoplast's pipeline systems cater to an extensive range of market sectors and applications covering infrastructure development, plumbing, oil & gas, district cooling, irrigation, landscaping and water extraction.

An ISO 9001 certified company, Cosmoplast has its production facilities based in Abu Dhabi converting over 75,000 metric tons of plastic per annum. In addition to these, Cosmoplast also has upcoming facilities in Saudi Arabia, Moscow and Kaliningrad.



COSMOPLAST PIPELINE SYSTEMS PRODUCT RANGE INCLUDES:

INFRASTRUCTURE PIPELINE SYSTEMS (uPVC, PE, GRP)

uPVC and Polyethylene pipeline systems with sizes ranging from 15mm up to 1200mm, well casings and screens and GRP pipeline systems with sizes from 100mm up to 1400mm for applications including

- Water extraction
- Water distribution
- Drainage
- Sewerage
- Gas distribution
- Cable ducting

PLUMBING SYSTEMS (UPVC, PP-R, PEX, HDPE DRAINAGE, CPVC)

Comprehensive range includes uPVC systems for drainage, random polypropylene (PP-R) [plain, fiber and aluminium composite] and cross linked polyethylene (PEX) systems for water and sanitary applications and uPVC high pressure pipes and fittings tor water supply and A/C Drain. Plumbing accessories such as pipe clamps, polyethylene compression fittings, solvent cements, lubricants and adhesives compliment this product range.

PRE-INSULATED PIPES (HDPE-HDPE, HDPE-GRP, HDPE-STEEL, GRP-HDPE, GRP-GRP, GRP-STEEL)

Jacket – core pipe combination with polyurethane insulation are used for applications such as District Cooling systems, Oil & Gas and other industrial applications. Cosmoplast provides HDPE and GRP pipes as jackets and HDPE, GRP and steel as core pipes.

IRRIGATION SYSTEMS (LLDPE)

Consists of high precision inline drip pipes and landscape and lawn edging. This range also includes saline resistant valves, drainage systems, sprinklers and central controllers.

REINFORCED THERMOPLASTIC PIPES (RTP)

Available in length of upto 500m, with a working pressure of 150 Bar at a temperature of 60 degrees celcius. RTP is used for gas distribution networks, oil flow lines and water injection lines.

BSEN 1452

WRAS Water Regulations Advisory Scheme

NSF

*Please refer to certificates for details

Intertek UKAS

ISO 9001

uPVC Pipes And Fittings

The expertise in manufacturing plastic piping systems in the Gulf region for more than four decades has enabled Cosmoplast to develop and deliver products with special consideration for the exclusive needs of the Gulf region. One such need is to provide the user with high quality, tough and durable replacement for normal metallic pipe and fittings for water distribution under pressure.

Cosmoplast uPVC pipes and fittings satisfy the increasing demand for metric and imperial sizes PVC pipes and fittings for plumbing and infrastructure applications, pertaining to cold water distribution, underground drainage, Air Conditioning (A/C) drain and ducting applications that demand high levels of toughness, chemical and thermal resistance along with cost effective installations.

Fields of Applications

Cosmoplast uPVC pipes and fittings are widely used in

- Distribution of cold water under pressure.
- Underground Drainage and Sewerage Lines.
- Air Conditioning Drain Systems.
- Piping networks for swimming pools facilities.
- Piping networks for rainwater utilization.
- Irrigation networks.
- Circulation of cold fluids in industry.
- Foodstuff industries.
- Transport of wide range of chemicals and corrosive fluids in the industry.

Features of Cosmoplast uPVC Pipes & Fittings

Easy Handling and Installation

uPVC pipes and fittings are lightweight (approximately one sixth the weight of steel) which results in reducing the transportation, handling, and installation costs. The installation does not require special tools other than normal pipe cutter.

Chemical and Corrosion Resistance

uPVC pipes and fittings are highly resistant to wide range of strong acids, alkalis, salt solutions, alcohols, and many other chemicals. This property makes uPVC Pressure pipes and fittings preferred in corrosive applications. The uPVC pipes and fittings are able to stand with low pH levels in water.

It also offers a major reduction in oxidation, which consequently guarantees the long durability of the system.

uPVC pipes and fittings are highly resistant to industrial fumes, humidity, salt water, weather and underground conditions. Scratches or surface abrasions do not provide points which corrosive elements can attack.

Resistance to Galvanic or Electrolytic Attack

uPVC pipes and fittings are resistant to galvanic and electrolytic attack. They can be used underground, underwater, and can be safely connected to metal parts.

Free from Toxicity, Odors, Tastes

uPVC pipes and fittings are non-toxic, odorless, and tasteless. Therefore they are ideal for use with drinking water.

Low Friction Loss

uPVC pipes and fittings have low coefficient of friction due to its smooth internal surfaces which results in low friction loss and high flow rate.

Therefore they will not fail prematurely due to corrosion or scale build-up, especially in areas where water, soil, and/or atmospheric conditions are aggressive in nature like the Gulf Region.

Resistance to Ultraviolet Exposure

Certain onsite temperatures are high in the Gulf region, and Cosmoplast uPVC systems can easily withstand the ultraviolet exposure commonly experienced during the construction phase of the projects, provided the onsite inventories are appropriately stored.

Although PVC pipes can be installed in direct sunlight, it will be affected by ultra-violet light which tends to discolor the pipe and can cause a loss of impact strength. No other properties are impaired. If the pipe is to be installed in continuous direct sunlight, it is advisable to paint the exterior with a white or light color paint.

Low Thermal Expansion

Laboratory testing and installation experience have demonstrated that the potential expansion problems in uPVC are much smaller than those which the coefficient of thermal expansion might suggest. The stresses developed within the uPVC pipes are generally much lower than those developed in equivalent metal pipe for equal temperature changes due to their elastic nature. experienced with metal installation.

Noise Reduction

uPVC piping system is a quiet system compared to metallic pipes, and therefore when used for water distribution in residential contexts, an additional advantage is derived. The low noise performance is due to the polymeric structure of the uPVC material, so the noise associated with water hammer is eliminated.

Cost Effectiveness

Cosmoplast uPVC system is cost effective and easy to install, due to the simple jointing method by using solvent cement or rubber joints in addition to the absence of costly metal cutting procedures.

No Fire Hazard

uPVC material is fire rated as Class 1 to BS476, Part 7 and Class 0 to Part 6. Once manufactured, uPVC compositions have a higher ignition temperature than many other commonly used thermoplastics, and other organic materials such as wood and paper.
uPVC pipes and fittings are self-extinguishing, and do not support combustion. They have an ASTM E84 flame-spread rate of 25 or less.

Resistance to Abrasion

Abrasions on uPVC pipes whether due to stress from abrasive fluids or excessive pressure are never localized and cause erosion over a large area. Generalizations would not be appropriate due to the large types of abrasions possible. Test have however shown that uPVC pipes are up to 2.5 times more resistant to abrasions when compared to mild steel. uPVC pipes are totally immune to tuberculation caused by soluble encrustants such as calcium carbonate, as it does not offer a firm base to any precipitate.

Soil and Traffic Loads

If the pipeline system is under constant use, the pressures within the pipes are enough to offset any external pressures. In cases where the pipes are expected to stand empty for long periods of time, it may be prudent to assess the external pressures and the precautions that are required to offset them.

Thrust Restraint

When liquids are transported, the internal pressures generate thrust forces, which may cause damage to the pipelines by deflection, extension or even joint separation. Thrust forces are usually calculated using the maximum internal pressures that the pipeline is expected to be subjected to. This in most cases is 1.5 times the working pressure.
In case of above the ground installations, custom built struts or brackets fixed in the ground serve the purpose of resisting the developed thrust. In below the ground pipelines, anchor blocks are constructed at points where thrusts develop. These anchor blocks distribute the thrust forces into the surrounding ground. It is therefore necessary to study the ground for stability before installation of the pipeline.
In cases where the pipes are encased in concrete, the pipes should first be wrapped in heavy gauze polyethylene sheets to allow slight flexibility to the pipes to distend its external dimensions marginally.

Working Temperature & Pressure

Working Temperature

Cosmoplast uPVC pipes and fittings are recommended for applications where the operating temperature does not exceed 60°C.

Working Pressure

The working pressure for uPVC pipes & fittings at 20° C is decided according to the manufacturing standard of the subject pipe.

At temperatures above 20°C the maximum allowable operating pressure is reduced and is defined by the Pressure / Temperature diagram.

At temperatures below 20°C, the resistance to internal pressure increases. However, the nominal pressure rating at 20°C, or PN, will still be the maximum allowable operating pressure at low temperatures.

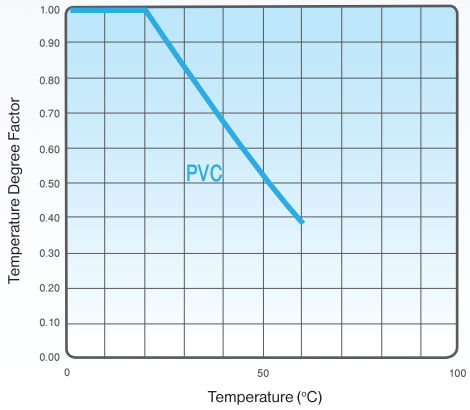
Internal Hydrostatic Pressure

PVC pipes for pressure applications are usually rated for pressure capacity (PN) at 20°C for European Standards or 23°C for American Standards.

The pressure capacity of PVC pipe is significantly related to its operating temperature, as operating temperature rises above 20°C (or 23°C), the pressure capacity of the PVC pipes decreases.

The Table below displays the response of PVC pressure pipe to change in operating temperature. Anticipated operating temperature is a critical factor that must be considered in the proper design of a PVC pressure piping system. The hydrostatic pressure capacity of PVC pipe is temperature dependent.

The hydrostatic pressure capacity of PVC pipes at high temperatures is usually predicted by multiplying the pressure rating at 20°C (or 23°C) by a de-rating factor as listed in the below diagram and table.



Operating Temperature	(°C)	20	30	40	50	60	70	80	90
PVC SCH80		1.00	0.83	0.67	0.52	0.38	Not Recommended		

NOTES:

1. The data shown above should be used as a general recommendation only and not as a guarantee on performance.
2. The maximum recommended temperature for PVC pressure pipes and fittings is 60°C (140°F).
3. Interpolate between the temperatures listed to calculate other factors.
4. The de-rating factors in the table assume sustained elevated service temperatures.

Friction Loss Through Pipes

Flow Rate		Flow Velocity V	Friction Head loss	Friction loss	Flow Velocity V	Friction Head loss	Friction loss	Flow Velocity V	Friction Head loss	Friction loss	Flow Velocity V	Friction Head loss	Friction loss
Gallon/min	Liter/min	m/sec	m/100m	MPa/100m	m/sec	m/100m	MPa/100m	m/sec	m/100m	MPa/100m	m/sec	m/100m	MPa/100m
—	—	1/2"			—	—	—	—	—	—	—	—	—
1	3.8	0.45	2.23	0.02	3/4"			—	—	—	—	—	—
2	7.6	0.90	8.05	0.08	0.48	1.73	0.02	1"			—	—	—
5	18.9	2.25	43.96	0.43	1.19	9.44	0.09	0.71	2.67	0.03	1-1/4"		
7	26.5	3.15	81.97	0.80	1.67	17.61	0.17	1.00	4.99	0.05	0.55	1.20	0.01
10	37.9	4.50	158.68	1.56	2.39	34.09	0.33	1.42	9.65	0.09	0.79	2.31	0.02
15	56.8	—	—	—	3.58	72.24	0.71	2.13	20.45	0.20	1.19	4.90	0.05
20	75.7	—	—	—	—	—	—	2.84	34.85	0.34	1.58	8.35	0.08
25	94.6	4"			—	—	—	3.56	52.68	0.52	1.98	12.63	0.12
30	114	0.26	0.08	0.00	—	—	—	4.27	73.84	0.72	2.37	17.70	0.17
35	132	0.30	0.11	0.00	—	—	—	4.98	98.23	0.96	2.77	23.55	0.23
40	151	0.35	0.14	0.00	—	—	—	5.69	125.79	1.23	3.16	30.15	0.30
45	170	0.39	0.17	0.00	5"			—	—	—	3.56	37.51	0.37
50	189	0.43	0.21	0.00	0.27	0.07	0.00	—	—	—	3.95	45.59	0.45
60	227	0.52	0.30	0.00	0.33	0.10	0.00	—	—	—	4.74	63.90	0.63
70	265	0.61	0.39	0.00	0.38	0.13	0.00	—	—	—	—	—	—
75	284	0.65	0.45	0.00	0.41	0.15	0.00	6"			—	—	—
80	303	0.70	0.51	0.00	0.44	0.16	0.00	0.31	0.07	0.00	—	—	—
90	341	0.78	0.63	0.01	0.49	0.20	0.00	0.34	0.09	0.00	—	—	—
100	379	0.87	0.76	0.01	0.55	0.25	0.00	0.38	0.10	0.00	—	—	—
125	473	1.09	1.16	0.01	0.68	0.38	0.00	0.48	0.16	0.00	8"		
150	568	1.30	1.62	0.02	0.82	0.53	0.01	0.57	0.22	0.00	0.33	0.06	0.00
175	662	1.52	2.16	0.02	0.96	0.70	0.01	0.67	0.29	0.00	0.38	0.07	0.00
200	757	1.74	2.76	0.03	1.10	0.90	0.01	0.76	0.37	0.00	0.44	0.10	0.00
250	946	2.17	4.17	0.04	1.37	1.36	0.01	0.96	0.57	0.01	0.54	0.14	0.00
300	1136	2.61	5.85	0.06	1.64	1.90	0.02	1.15	0.79	0.01	0.65	0.20	0.00
350	1325	3.04	7.78	0.08	1.92	2.53	0.02	1.34	1.05	0.01	0.76	0.27	0.00
400	1514	3.48	9.96	0.10	2.19	3.24	0.03	1.53	1.35	0.01	0.87	0.34	0.00
450	1703	—	—	—	2.47	4.04	0.04	1.72	1.68	0.02	0.98	0.43	0.00
500	1893	—	—	—	2.74	4.91	0.05	1.91	2.04	0.02	1.09	0.52	0.01
750	2839	18"			—	—	—	2.87	4.32	0.04	1.63	1.10	0.01
1000	3785	0.49	0.05	0.00	20"			3.82	7.37	0.07	2.18	1.87	0.02
1250	4731	0.61	0.07	0.00	0.49	0.04	0.00	—	—	—	2.72	2.83	0.03
1500	5678	0.73	0.10	0.00	0.59	0.06	0.00	24"			3.26	3.97	0.04
2000	7570	0.97	0.18	0.00	0.79	0.10	0.00	0.54	0.04	0.00	—	—	—
2500	9463	1.21	0.27	0.00	0.98	0.16	0.00	0.68	0.06	0.00	—	—	—
3000	11355	1.46	0.37	0.00	1.18	0.22	0.00	0.81	0.09	0.00	—	—	—
3500	13248	1.70	0.50	0.00	1.37	0.30	0.00	0.95	0.12	0.00	—	—	—
4000	15140	1.94	0.64	0.01	1.57	0.38	0.00	1.09	0.15	0.00	—	—	—
4500	17033	2.19	0.79	0.01	1.77	0.47	0.00	1.22	0.19	0.00	—	—	—
5000	18925	2.43	0.96	0.01	1.96	0.57	0.01	1.36	0.23	0.00	—	—	—
5500	20818	2.67	1.15	0.01	2.16	0.68	0.01	1.49	0.28	0.00	—	—	—
6000	22710	2.91	1.35	0.01	2.36	0.80	0.01	1.63	0.33	0.00	—	—	—
6500	24603	3.16	1.56	0.02	2.55	0.93	0.01	1.77	0.38	0.00	—	—	—
7000	26495	3.40	1.79	0.02	2.75	1.07	0.01	1.90	0.44	0.00	—	—	—
7500	28388	—	—	—	2.94	1.21	0.01	2.04	0.49	0.00	—	—	—
8000	30280	—	—	—	3.14	1.37	0.01	2.17	0.56	0.01	—	—	—
8500	32173	—	—	—	—	—	—	2.31	0.62	0.01	—	—	—
9000	34065	—	—	—	—	—	—	2.44	0.69	0.01	—	—	—
9500	35958	—	—	—	—	—	—	2.58	0.77	0.01	—	—	—
10000	37850	—	—	—	—	—	—	2.72	0.84	0.01	—	—	—

Friction Loss Through Fittings

Piping systems consist of pipes, fittings and valves. The friction loss through fittings and valves is usually described as being equivalent to pressure loss through a certain length of straight pipe.

The below table gives the friction loss in PVC fittings as an equivalent straight length of pipe (mm):

FITTING	Nominal Pipe Size												
	½″	¾″	1″	1¼″	1½″	2″	2½″	3″	4″	6″	8″	10″	12″
	15mm	20mm	32mm	40mm	50mm	63mm	75mm	90mm	110mm	160mm	200mm	250mm	315mm
90^0 Elbow	45.72	60.96	76.20	116	122	174	210	241	366	549	671	792	975
45^0 Elbow	24	33.53	43	55	64	79	94.5	122	155	244	323	411	472
Gatevalve	9	12	18	24	30.5	46	61	91	-	-	-	-	-
Tee (Flow Through RUN)	30.5	43	52	70	82	131	155	189	253	381	503	533	610
Tee (Flow Through BRANCH)	122	152	183	213	244	366	475	488	671	997	1493	1737	2042
Male/Female Adapter	30.5	46	61	85	107	137	168	198	274	427	-	-	-

Note: All friction loss values are in cm.

Material Properties

Property	Value	Units
Physical properties		
Density	≥ 1.42	g/cc
Water absorption	≤ 4	mg/cm^2
Impact strength (23°C)	7	KJ/m^2
Hardness	80	Shore D
Mechanical properties		
Tensile strength	≥ 45	N/mm^2
Elongation	≥ 80	%
Elastic Tensile Modulus	≥ 2700	MPa
Thermal properties		
Vicat Softening point	≥79	°C
Coefficient of Linear thermal expansion	0.08	mm/m°C
Thermal conductivity	0.16	W/(m.K)
Others		
Flammability	V-0	UL-94
Poisson's ratio	0.4	-
Hazen-Williams factor C	150	-

Jointing Techniques for Small Sizes (8˝and below)

Solvent Cement Jointing Procedure

1 Cut the pipe at right angle to the pipe axis using suitable sharp pipe cutter. The pipe may be cut quickly and efficiently by Wheel-type plastic tubing cutter or Ratchet type cutters or fine tooth saws.


2 Remove burrs and filings from the outside and inside of the tube.


3 Clean the pipe and the fitting with dry cloth, in order to avoid any dust or sand that might affect the quality of the joint. It is recommended to roughen the mating surface using a emery paper. Clean the spigot and socket area with a dry cloth (natural fibers) to remove all dirt and moisture from spigot and socket.

4 Apply cleaner solution to the outside surface of the pipe and to the inside surface of the fitting. Cleaner will prepare the surface for jointing for a better quality joint.


5 Using a suitably sized brush, apply a thin even coat of solvent cement to the internal surface of the fitting socket first then to the pipe spigot. Excess solvent cement must be avoided as pools of solvent cement will continue to attack the PVC and weaken the pipe.


6 While both surfaces are still wet with solvent cement, insert the pipe into the fitting in a single movement. Do not stop halfway for a better distribution of the solvent cement, twist the pipe a 1/4 turn during insertion into the socket.

7 Wipe any excess cement from the pipe and leave the joint to dry completely.

8 Leave the system for at least 12 hours before filling with water.

9 At temperatures of 16°C and above, leave the system for 24 hours before pressure testing. At lower temperatures, 48 hours is necessary before pressure testing.

Solvent Welding in hot weather conditions:

During hot weather conditions of 35°C and above, special consideration should be given to the process of Solvent Welding of UPVC pipes and fittings to ensure a leak proof joint.

Solvent cements contain high strength chemical solvents which evaporate faster at elevated temperatures and in windy conditions.

When PVC pipes are stored in open areas or under direct sunlight, the pipe surface temperature will be around 15ºC higher than the ambient temperature. The solvent cement attacks the hot surfaces faster and deeper. Therefore, it is very important to avoid using excess cement during the jointing process to avoid creating pools of cement inside the fitting and pipe sockets. Excess solvent cement should be wiped off the joined surfaces quickly.

Recommendation for the solvent welding during hot weather conditions:

1. Solvent cements and cleaners should be stored in a cool or shady area.
2. Pipes and fittings should be stored in a shady area before solvent welding.
3. The surfaces to be joined should be cooled by wiping with wet cloth. The surfaces should be dry before applying the solvent cement.
4. Solvent welding is recommended to be done during the morning hours.
5. The two surfaces should be joined quickly while they are still wet with cement.
6. Shake or stir the solvent cement well before use.
7. Allow at least 24 hours for the joints to cure before pressurizing the system. For sizes above 8" at least 48 hours should be allowed.

Rubber Ring (Push Fit) Jointing Procedure

1 Cut the pipe at right angle to the pipe axis using suitable sharp pipe cutter. The pipe may be cut quickly and efficiently by Wheel-type plastic tubing cutter or Ratchet type cutters or fine tooth saws.

2 Remove burrs and filings from the outside and inside of the tube.

3 Clean the pipe and the fitting with a dry cloth, in order to avoid any dust or sand that might affect the quality of the joint. Clean the spigot and socket area with a dry cloth (natural fibers) to remove all dirt and moisture from spigot and socket.

4 Using suitably sized brush, apply an even layer of an approved joint lubricant on the rubber seal.

5 While both surfaces are still wet with lubricant, insert the pipe into the fitting in a single movement. Do not stop halfway, since the bond will start to set immediately and it will be almost impossible to insert further. For better distribution of the lubricant, make a 1/4 turn while inserting the pipe into the socket.

6 Wipe off any excess lubricant from the pipe.

Jointing Techniques for Big Sizes (above 8´)

Rubber Ring Jointing

1 Before installation, it is prudent to check both the spigot and socket for any damage. Spigot chamfer and sealing ring should be especially examined.

Chamfering should be done at an angle of 15 degrees from the axis of the pipe till it reaches half the thickness of the pipe wall.

A fine toothed saw may be used for cutting the pipes and a file or specialised chamfering should be used for completing the chamfer. After removing swarf and burrs from the chamfered spigot, the sealing ring should be seated in the socket groove. All portions of the joint must be thoroughly checked for damage.

2 The depth from the mouth of the spigot to the shoulder of the socket is the spigot insertion depth. This should be clearly marked on the spigot, including any tolerances for anticipated changes in operating temperature.

3 The mating areas of the spigot and socket should be free of dirt or moisture before sealing takes place.

4 Proper lubrication of the spigot end and triple seal portion up to the full insertion depth and circumference must be done before sealing. There must never be any dry areas left on the mating surfaces.

5 The lubrication must not be allowed to run dry before the spigot and the socket are brought into contact. Aligment is crucial at this stage and therefore, the spigot should be inserted into the socket by hand until the inner sealing ring offers resistance.

Leverage Jointing

This method can be used for pipe sizes up to nominal diameter of 8 inches. A crow bar, with a stout timber inserted between it and the pipe is used to leverage the joint. This is done to avoid damage to the pipe. A steady pressure is applied till the spigot insertion depth mark coincides with the mouth of the socket being jointed.
If there is any undue resistance felt during the jointing, the joint should be disassembled to check for improper lubrication or pinched or trapped sealing ring.

Jointing Clamps

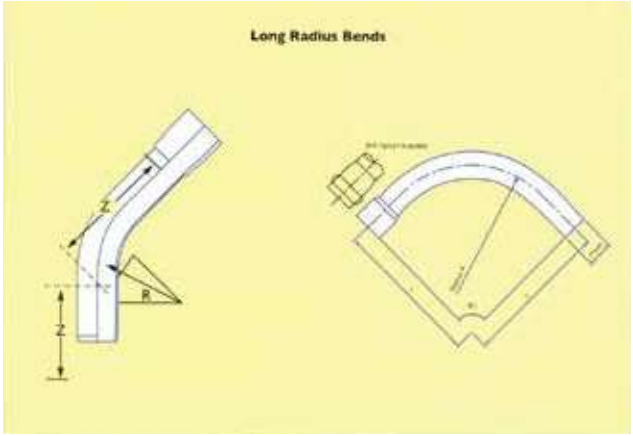
Used for nominal diameters greater than 8 inches, clamps are especially useful while installing bends in the pipeline. The clamps are positioned in such a way that one is next to the shoulder of the socket and the other is close to the depth insertion mark, but does not overlap. To draw the spigot into the socket, a ratcheting mechanism can be used. Alignment is crucial and should be continuously monitored while ratcheting is in progress. Clamps must never be used without the protective pad as these prevent damage to the pipe surfaces.

A few essentials must always be remembered while jointing.

1- Spigot and sealing ring must be well lubricated
2- The pipes must be properly aligned
3- Use of excessive force while jointing can damage the pipes permanently
4- The spigot should be inserted only up to the depth insertion mark

Fabrication

Even with the wide range of solutions offered by Cosmoplast, there are still some specific applications that remain uncovered due to the diversity of the industries we serve. In order to fully satisfy these needs Cosmoplast offers fabricated uPVC fittings that are tailor-made to address design and assembly requirements unfulfilled by its own wide range of standard off the shelf products.



Threaded Joints

Cutting of threads on PVC pipes is not an acceptable practice. Instead, moulded threaded adaptors should be used for the available sizes.

Recommendations for Threaded Joints

1 For threaded fittings, use Teflon thread-wrap tape in order to guarantee the water- tightness.

2 Grease or solvent cement should never be used on the threads.

3 Test the threaded parts before final assembly to ensure thread matching, particularly when connecting to other materials or to other manufacturers' fittings. The amount of Teflon tape should be Judged accordingly.

4 The threaded joints should be tightened initially by hand, and then a further two more turns should be sufficient to create a seal.

Note. Over tightening will over stress the fitting and could cause cracks and leakage.

5 When making a transition connection to metal threads, use male threaded adapter whenever possible. This is necessary to avoid cracking the female uPVC fitting due to over tightening in presence of extra Teflon tape.

Brass Threaded Fittings

Cosmoplast presents an innovative range of uPVC fittings with brass threads which are recommended for jointing uPVC pipework to metal pipe work. These fittings present an additional security when assembling metallic valves, angle valves, bib taps,..etc where an additional over-tightening is expected by the installers.

Expansion in PVC Pipes

The PVC piping systems expand and contract with changes in temperature, both from ambient temperature and from the temperature of the fluid passing through the pipework.

The following sections explain the techniques of estimating and treating the expansion in PVC pipes.

Calculation of Expansion

The co-efficient of linear expansion of PVC pipes is relatively small compared to other plastic materials. However, the effects of thermal expansion in the system should be compensated wherever necessary.

The thermal expansion in PVC straight sections can be calculated using the below formula:

$$\Delta L = \alpha \times L \times \Delta T$$

Where:

ΔL = expansion (mm)

α = co-efficient of linear expansion (mm/m/°C) = 0.08

L = length of the pipe (m)

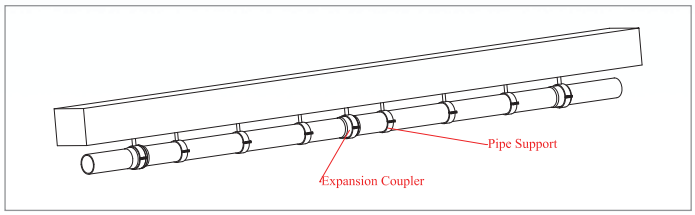
ΔT = temperature difference (°C) between the hottest month of the year and the month during which the installation is to be carried out.

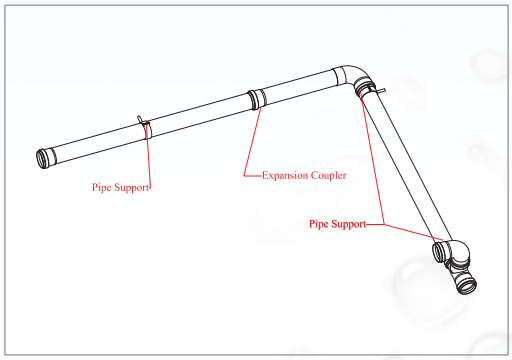
Support and Expansion Distances

In general, rubber ring pipework (Push Fit) do not require expansion joints, as the rubber sockets in the fittings and pipes act as expansion joints to absorb the expansion and contraction.

Whereas in solvent welding pipework, the expansion should be calculated and compensated as described below.

After calculating the thermal expansion in the PVC pipes, expansion couplers (Rubber ring couplers) should be installed in proper locations to absorb the changes in pipe length.



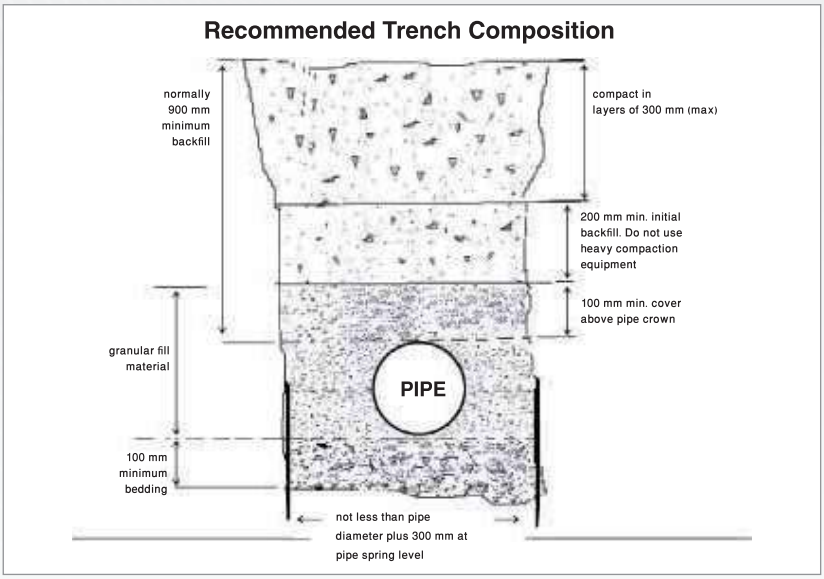


Trench Work

While designing the pipeline systems, the level and depth of the trench is calculated depending on factors such as terrain and the usage for which the pipeline is to be installed.

Excavation and pipe laying must take place simultaneously as leaving open trenches for too long makes them unsuitable for use. As pipe laying advances, trenches must be backfilled immediately. The pipe joints, however, should be left exposed until after the pipeline system has been tested. The minimum width of the trench must be equal to the pipe diameter plus 300-mm. At the crown of the pipe, the trench width must not exceed the pipe diameter plus an additional 600-mm.

The width of the trench at ground level will depend on the type of subsoil and buried depth of the pipeline. The minimum width of the trench at the pipe springing line should be as narrow as practicable but not less than the pipe diameter plus 300mm.



If the pipe is to be laid directly onto the trench bottom make sure that the trench formation is composed of stable and uniform, fine-grained soil, with no large flints or stones, or other protuberances, which might cause point loading on the pipe.

Additional excavation will be required at the position of the pipe sockets to ensure proper joint assembly and pipe support. If the formation is unsuitable for direct laying the trench will need to be excavated to a further depth of a minimum of 100mm below the underside of the pipe.

Pipelines laid through rock should always be laid on a minimum of 100mm bed of suitable bedding materials.

The Pipe should be uniformly and continuously supported over its entire length on firm stable material.

Pipe may be installed in a wide range of native soils. The pipe embedment should be stable and placed in such a manner as to evenly support and physically shield the pipe from damage. Attention should be given to local pipe laying experience, which may indicate solutions to particular pipe bedding problems.

The pipe embedment materials should be stable, sufficiently granular to be readily worked under the sides of the pipe to provide satisfactory haunching, and readily compactable to achieve soil densities specified by contract documents. These qualities are available in the following materials:

Gravels and sands classified as soil types GW, GP,SW and SP or by a dual soil classification beginning with one of these symbols.(see ASTM D 2487).
Sands and gravels classified as soil types GM, GC, SM and SC (see ASTM D 2487).

Initial backfill materials should be placed in compacted layers. All native and other materials in the pipe embedment zone should be free from refuse, organic materials, cobbles, boulders, large rock or stones or frozen soils. The particle size of material in contact with the pipe should preferably be of size 5 mm to 10 mm grade.

Each soil layer should be sufficiently compacted to uniformly develop lateral passive soil forces during the backfill operation.

When installing pipe in locations where rapid movement of ground water may result in migration of soil fines into, out of, or between layers of the embedment material, the bedding and backfill should be of such gradation in particle size as to preclude this possibility.

Vibratory methods are preferred when compacting sand or gravels. Best results are obtained when the soil are in a nearly saturated condition.

The final backfill should be placed and spread in approximately uniform layers in such a manner as to fill the trench completely so that there will be no unfilled spaces under or about rocks or lumps of earth in the backfill. Large rocks, stones and other debris should be removed.

When compaction is required, it should only be used to consolidate the final backfill, provided the pipe is covered by at least 300 mm of backfill

Trenches under pavements, sidewalks or road should be backfilled and compacted to the required density specified by contract documents.
(Reference 0 ASTM D 2774)

Installing Pipes on A Curve

When pipes are required to be installed on a curve, the pipe should be jointed straight and then laid to the curve.

Bending of pipes is achieved by lateral loading by any convenient means, and fixing in place by appropriate fixings clamp.

Curved installation should not be executed on rubber ring joints, as this creates stresses in the spigot and socket that may destroy the joint.

For Solvent cement jointed pipes bending may be applied only after full curing.

Pipeline Design and Installation

Deflection

uPVC pipes are inherently flexible to negotiate gentle bends on their own even though the integral socket permits an angular deflection of up to 1.5 degrees at the joint. In case additional cold bending is required, its radius can be calculated as follows

R (radius) = 250 x D (External diameter)

In case the pipeline is to be curved to deflection greater than the flexibility allowed by the pipes, it becomes necessary to introduce uPVC formed bends.

Thermal Movement

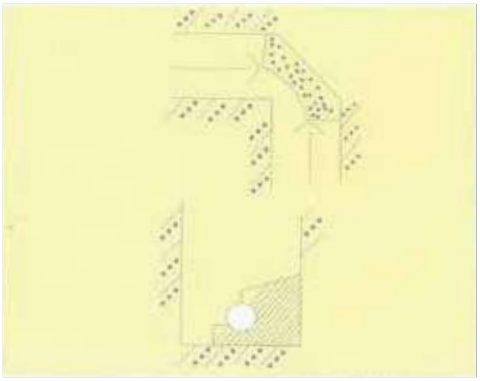
Once a pipeline system is installed and backfilled it is safe from thermal movements and fluctuations, as the underground temperature remains more or less, constant. Temperature variables are particularly important when solvent welded joints are being used, as they are sensitive to thermal movements. Enough time should be allowed to let them assume their normal dimensions before final installation procedures are carried out. This, however, is not necessary when using push fit joints.

Thrust Forces

Whenever push-fit joint are used in the construction of a pipeline, the pipes are subjected to internal pressure and the resulting thrust force might cause separation. To prevent this, concrete thrust blocks are used whenever pipelines undergo directional changes or whenever it is necessary to install branches and caps or valves etc. uPVC pipes are designed for a 50 year installed life time. Therefore the thrust blocks used should also be designed with the same specifications in mind. It is necessary to take into account the maximum foreseeable line pressure when calculating the thrust forces in order to provide an adequate safety margin for the pipeline system.

Since uPVC is a flexible material, it is prudent to design thrust blocks in such a way that the area of contact between the pipe fitting in question and the thrust block is at its greatest. This is a especially important for providing a restraint against excessive flexing as well as thrust. This may also be applicable to solvent welded pipeline where certain soil conditions may cause thrust forces to be exerted. In such situation, the pipeline may benefit from the extra restrain offered by thrust blocks in places where the system makes a sudden directional change.

Due to pressure fluctuations, uPVC pipes tend to distend and contract. In order to allow this to happen without damaging the pipeline, it is necessary to avoid encasing the fittings in thrust block concrete. In case total encasement is desired, the fitting must first be wrapped in heavy gauze Polyethylene film layers to protect it from damage.



Pipe Supports

Brackets and Clips

Pipe supports and brackets should provide continuous support for at least 120° of the pipe circumference.

Sliding Joints

Sliding joints allow the pipe to move without restraint along its axis while still being supported. Pipe clamps with rubber lining should be used to prevent the support from scratching or damaging the pipe during expansion and contraction.

Fixed Joints

A fixed support rigidly connects the pipeline to a structure totally restricting movement in at least two planes of direction. Such a support can be used to absorb moments and thrusts.

Placement of Supports

The places of pipe clamps should be selected considering that thermal and other movements do not result significant bending moments at rigid connections or at bends or tees.

Supporting Distances

The below table shows the supporting distances for PVC pipes carrying water at 20°C.
If temperatures are in excess of 20°C the horizontal spacing should be reduced by 25% for every 10°C. At 60°C, continuous horizontal support is required.

Size (mm)	Size (Inch)	Maximum Support Spacing	
		Horizontal (m)	Vertical (m)
15	½″	0.60	1.20
20	-	0.70	1.40
25	¾″	0.75	1.50
32	1″	0.85	1.70
40	1¼″	0.90	1.80
50	1½″	1.05	2.10
63	2″	1.20	2.40
75	2½″	1.35	2.70
90	3″	1.35	2.80
110	4″	1.50	3.00
125	5″	1.70	3.40
160	6″	2.00	4.00
180	-	2.20	4.40
200	8″	2.30	4.60
225	-	2.50	5.00
250	10″	2.60	5.20
315	12″	3.00	6.00

Pipe Supports

Testing PVC Networks

PVC installations should be tested for leaks and defects in new installations and whenever the existing installation is altered, extended or repaired.

All new installations or modified portions should be left uncovered until the testing is successfully completed and approved.

Drainage systems are commonly tested by water and in some cases air test is done.
The following are some guidelines for testing drainage systems, while the local codes of practice for each country should be also noted and applied.

Pressure Test for Water Networks Inside Buildings

- The pipeline may be tested as a whole or in sections, depending on the diameter and length of the pipe and the spacing between sections.
- Before performing pressure testing, all supports must be finished.
- Special care should be taken while filling the system with water to ensure removing air from the system before pressurizing the system.
- uPVC pipelines are usually tested at 1.5 times the working pressure.
- After reaching the test pressure, the drop in pressure must be noted over time. Slight pressure drop normally occurs as the remaining air goes into solution, and due to some further expansion of the pipe.
- Re-pressurize the system to the testing pressure and again note the drop in pressure over the same time period.
- Constant pressure (or very small drop) indicates a satisfactory result, while bigger pressure drop may indicate a leak.
- It is recommended that the test pressure should be held for a minimum period of 15 minutes.
- After completing the pressure test, the pipeline should be thoroughly flushed and dosed with a sterilizing agent such as chlorine. Local authority requirements should be followed.

Hydrostatic Pressure Test for Pipelines

Testing a pipeline will be subject to limitations such as availability of water. Testing of very long pipeline systems can be carried out in sections. The section under test is usually blanked off using blank iron or steel flange. This is drilled and tapped for connecting the appropriate test equipment. It should be strutted for protection against end thrust.

All the test equipment should be located at the lowest point of the pipelines section under test. Testing must not be carried out against closed valves.

The pressure gauge should be located at the lowest end of the pipeline and its calibration should be adjusted according to the pipe's position.

Anchor blocks and solvent welded joints should be allowed adequate time to build full strength before testing is carried out. Above the ground supports and anchors should also be properly installed before testing. Underground installations, particularly those that have been deflected, should be properly backfilled, except for joints that should be left exposed until after testing it complete. Once pipe, valves and pressure guages are assembled, fill of the main can commence.

Water should be allowed to flow into the main from the lowest point and air cocks should left in the open position. Once water, visibly free from any aeration, starts flowing through the air cocks they should then be closed one by one, starting from the lowest. After the main is fully charged, it should be allowed to stand overnight and any seepage should be made good before pressure testing begins. Mechanical pumps should be used to attain the requisite test pressure. Although the testing engineer will determine the exact specifications of the test, a general rule of thumb is not to exceed 1.5 times the working pressure of the lowest rated component of the pipeline system and a time limit of 24 hours is usually ideal to test a pipeline this standard is widely accepted. A water loss of 3 litres per kilometer of pipe, per 25 mm nominal bore, per 3 bar of test pressure every 24 hours is considered permissible.

Although air testing of the pipeline system is not permitted, there may be cases where it might be necessary to carry out pneumatic testing. It should however be limited to a maximum pressure of 1.5 bar. Air leaks can be detected by covering the joints with soap solution or by introducing Ethyl Mercaptan in the air being pumped into the pipeline for test. Care should be take to prevent any personnel from working near the section being put under testing as any mishandling of the main being tested under pneumatic pressure can be dangerous.

Handling, Storage and Transportation

uPVC pipes can be damaged by rough handling. Transportation, storage and handling should be done taking into consideration the below directions and precautions.

Handling & Storage

- Take all reasonable care when handling uPVC, particularly in very cold conditions when the impact strength of the material is reduced.
- Do not throw or drop pipes, or drag them along hard surfaces.
- In case of mechanical handling, use protective slings and padded supports. Metal chains and hooks should not make direct contact with the pipes.
- To avoid deformation over time, pipes should be stacked:
  » either on a flat base
  » or on a level ground
  » or on 75mm x 75mm timber at 1m max. centers.
- For long-term storage (longer than 3 months) the maximum free height should not exceed 1.5m. The heaviest pipes should be on the bottom. Small pipes may be nested inside larger pipes.
- Provide side support with 75mm wide battens at 1m centers.
- Vertical side supports should also be provided at intervals of 3m along rectangular pipe stacks.

- Maximum stack height is 1.7 meters regardless the pipe diameter.
- If stored in the open for long periods or exposed to strong sunlight, cover the stack with heavy sheets. Coverings such as black plastic must not be used as these can greatly increase the temperatures within the stack.
- Keep fittings in original packaging until required for use. Store fittings under cover.
- Protect the pipes from dirt, gravel or mud, as this could damage the ring seals.

Transportation

- While in transit pipes should be well secured and supported.
- Pipes should be arranged safely on trucks avoiding crossing, bending and over stacking.
- Care should be taken that the pipes are firmly tied so that the sockets cannot rub together.
- Pipes may be unloaded from vehicles by rolling them gently down timbers.

Chemical Resistance of uPVC

The uPVC material has a high resistance to a wide range of chemicals which makes the uPVC as an ideal option for many residential and industrial applications.

Detailed tables for the chemical resistance of uPVC material can be provided upon request.

Standards

Cosmoplast High Pressure uPVC pipes and fittings are manufactured in accordance with the following standards:

DIN 8062	Unplasticized polyvinyl chloride (PVC-U) pipes; dimensions
DIN 8061	Unplasticized polyvinyl chloride pipes - General quality requirements and testing
BSEN 1452	Plastic piping system for potable water (PVC-U)
ASTM D 1785	Standard Specification for PolyVinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D 2241 96A	Polyvinyl Chloride (PVC) Pressure Rated Pipes, (SDR Series)
ASTM D 2467	Standard Specification for PolyVinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
BS 3505	Specification for unplasticized polyvinyl chloride (PVC-U) pressure pipes for cold potable water
BS 3506	Specification for unplasticized PVC pipe for industrial uses
BS 4346	Joints and fittings for use with unplasticized PVC pressure pipes. Specification for solvent cement
ASTM D 2464	Standard Specification for Threaded PolyVinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
DIN 8063	Pipe Joints and Pipe Fittings for Pipes under Pressure made of Unplasticized Polyvinyl Chloride (Rigid PVC)
ASTM D 2466	Standard Specification for PolyVinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
ISO 4422-2	uPVC Pipes and fittings for water supply Superseded by ISO 1452-2 / BSEN ISO 1452
ASTM D 2241- 09	Standard Specification for Polyvinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)

Pipe Specifications

Metric Sizes:

DIN 8061/62 : PVC-U Pressure Pipes (SF=2.5)*

Nominal Outside Diameter		Wall Thickness																			
	SF	2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5	
	PN	1.6		4		5		6		8		10		12.5		16		20		25	
d_n (mm)	S	S 63		S 25		S 20		S 16.7		S 12.5		S 10		S 8		S 6.3		S 5		S 4	
	SDR	SDR 127		SDR 51		SDR 41		SDR 34.4		SDR 26		SDR 21		SDR 17		SDR 13.6		SDR 11		SDR 9	
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
12		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	1.5	1.4	1.8
16		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.6	1.5	1.9	1.8	2.2
20		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	1.9	1.9	2.3	2.3	2.8
25		-	-	-	-	-	-	-	-	-	-	-	-	1.5	1.9	1.9	2.3	2.3	2.8	2.8	3.3
32		-	-	-	-	-	-	-	-	-	-	1.6	2.0	1.9	2.3	2.4	2.9	2.9	3.4	3.6	4.2
40		-	-	-	-	-	-	-	-	1.6	2.0	1.9	2.3	2.4	2.9	3.0	3.5	3.7	4.3	4.5	5.2
50		-	-	-	-	-	-	1.5	1.9	2.0	2.4	2.4	2.9	3.0	3.5	3.7	4.3	4.6	5.3	5.6	6.4
63		-	-	-	-	1.6	2.0	1.9	2.3	2.5	3.0	3.0	3.5	3.8	4.4	4.7	5.4	5.8	6.6	7.0	7.9
75		-	-	1.5	1.9	1.9	2.3	2.2	2.7	2.9	3.4	3.6	4.2	4.5	5.2	5.6	6.4	6.8	7.7	8.4	9.5
90		-	-	1.8	2.2	2.2	2.7	2.7	3.2	3.5	4.1	4.3	5.0	5.4	6.2	6.7	7.6	8.2	9.3	10.1	11.4
110		1.8	2.2	2.2	2.7	2.7	3.2	3.2	3.8	4.2	4.9	5.3	6.1	6.6	7.5	8.1	9.2	10.0	11.2	12.3	13.8
125		1.8	2.2	2.5	3.0	3.1	3.7	3.7	4.3	4.8	5.5	6.0	6.8	7.4	8.4	9.2	10.4	11.4	12.8	14.0	15.6
140		1.8	2.2	2.8	3.3	3.5	4.1	4.1	4.8	5.4	6.2	6.7	7.6	8.3	9.4	10.3	11.6	12.7	14.2	15.7	17.5
160		1.8	2.2	3.2	3.8	4.0	4.6	4.7	5.4	6.2	7.1	7.7	8.7	9.5	10.7	11.8	13.2	14.6	16.3	17.9	19.9
180		1.8	2.2	3.6	4.2	4.4	5.1	5.3	6.1	6.9	7.8	8.6	9.7	10.7	12.0	13.3	14.9	16.4	18.3	20.1	22.4
200		1.8	2.2	3.9	4.5	4.9	5.6	5.9	6.7	7.7	8.7	9.6	10.8	11.9	13.3	14.7	16.4	18.2	20.3	22.4	24.9
225		1.8	2.2	4.4	5.1	5.5	6.3	6.6	7.5	8.6	9.7	10.8	12.1	13.4	15.0	16.6	18.5	20.5	22.8	25.2	28.0
250		2.0	2.4	4.9	5.6	6.2	7.1	7.3	8.3	9.6	10.8	11.9	13.3	14.8	16.5	18.4	20.5	22.7	25.2	27.9	30.9
280		2.2	2.7	5.5	6.3	6.0	6.8	8.2	9.3	12.0	13.4	13.4	15.0	16.8	18.7	20.6	22.9	25.4	28.2	31.3	34.7
315		2.5	3.0	6.2	7.1	7.7	8.7	9.2	10.4	13.5	15.1	15.0	16.7	18.7	20.8	23.2	25.8	28.6	31.7	-	-
355		2.8	3.3	7.0	7.9	8.7	9.8	10.4	11.7	15.2	17.0	16.9	18.8	21.1	23.5	26.1	29.0	-	-	-	-
400		3.2	3.8	7.9	8.9	9.8	11.0	11.7	13.1	17.1	19.1	19.1	21.3	23.7	26.3	29.4	32.6	-	-	-	-
450		3.6	4.2	8.8	9.9	11.0	12.3	13.2	14.8	19.2	21.4	21.5	23.9	26.7	29.6	-	-	-	-	-	-
500		4.0	4.6	9.8	11.0	12.3	13.8	14.6	16.3	21.4	23.8	23.9	26.5	29.7	32.9	-	-	-	-	-	-
560		4.4	5.1	11.0	12.3	13.7	15.3	16.4	18.3	23.9	26.5	26.7	29.6	-	-	-	-	-	-	-	-
630		5.0	5.7	12.3	13.8	15.4	17.2	18.4	20.5	26.9	29.8	30.0	33.2	-	-	-	-	-	-	-	-

Note: S = pipe series, SF = safety factor 2.5, PN = working pressure at 20˚C for 50 years of service

*Suitable for water supply, sewerage and ducting applications

DIN 8061/62 : PVC-U pressures pipes (SF=2)*

Nominal Outside Diameter		Wall Thickness (mm)																			
	SF	2		2		2		2		2		2		2		2		2		2	
	PN	2		5		6		8		10		12.5		16		20		25		32	
d_n (mm)	S	S 63		S 25		S 20		S 16.7		S 12.5		S 10		S 8		S 6.3		S 5		S 4	
	SDR	SDR 127		SDR 51		SDR 41		SDR 34.4		SDR 26		SDR 21		SDR 17		SDR 13.6		SDR 11		SDR 9	
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
12		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	1.5	1.4	1.8
16		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.6	1.5	1.9	1.8	2.2
20		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	1.9	1.9	2.3	2.3	2.8
25		-	-	-	-	-	-	-	-	-	-	-	-	1.5	1.9	1.9	2.3	2.3	2.8	2.8	3.3
32		-	-	-	-	-	-	-	-	-	-	1.6	2.0	1.9	2.3	2.4	2.9	2.9	3.4	3.6	4.2
40		-	-	-	-	-	-	-	-	1.6	2.0	1.9	2.3	2.4	2.9	3.0	3.5	3.7	4.3	4.5	5.2
50		-	-	-	-	-	-	1.5	1.9	2.0	2.4	2.4	2.9	3.0	3.5	3.7	4.3	4.6	5.3	5.6	6.4
63		-	-	-	-	1.6	2.0	1.9	2.3	2.5	3.0	3.0	3.5	3.8	4.4	4.7	5.4	5.8	6.6	7.0	7.9
75		-	-	1.5	1.9	1.9	2.3	2.2	2.7	2.9	3.4	3.6	4.2	4.5	5.2	5.6	6.4	6.8	7.7	8.4	9.5
90		-	-	1.8	2.2	2.2	2.7	2.7	3.2	3.5	4.1	4.3	5.0	5.4	6.2	6.7	7.6	8.2	9.3	10.1	11.4
110		1.8	2.2	2.2	2.7	2.7	3.2	3.2	3.8	4.2	4.9	5.3	6.1	6.6	7.5	8.1	9.2	10.0	11.2	12.3	13.8
125		1.8	2.2	2.5	3.0	3.1	3.7	3.7	4.3	4.8	5.5	6.0	6.8	7.4	8.4	9.2	10.4	11.4	12.8	14.0	15.6
140		1.8	2.2	2.8	3.3	3.5	4.1	4.1	4.8	5.4	6.2	6.7	7.6	8.3	9.4	10.3	11.6	12.7	14.2	15.7	17.5
160		1.8	2.2	3.2	3.8	4.0	4.6	4.7	5.4	6.2	7.1	7.7	8.7	9.5	10.7	11.8	13.2	14.6	16.3	17.9	19.9
180		1.8	2.2	3.6	4.2	4.4	5.1	5.3	6.1	6.9	7.8	8.6	9.7	10.7	12.0	13.3	14.9	16.4	18.3	20.1	22.4
200		1.8	2.2	3.9	4.5	4.9	5.6	5.9	6.7	7.7	8.7	9.6	10.8	11.9	13.3	14.7	16.4	18.2	20.3	22.4	24.9
225		1.8	2.2	4.4	5.1	5.5	6.3	6.6	7.5	8.6	9.7	10.8	12.1	13.4	15.0	16.6	18.5	20.5	22.8	25.2	28.0
250		2.0	2.4	4.9	5.6	6.2	7.1	7.3	8.3	9.6	10.8	11.9	13.3	14.8	16.5	18.4	20.5	22.7	25.2	27.9	30.9
280		2.2	2.7	5.5	6.3	6.0	6.8	8.2	9.3	12.0	13.4	13.4	15.0	16.8	18.7	20.7	22.9	25.4	28.2	31.3	34.7
315		2.5	3.0	6.2	7.1	7.7	8.7	9.2	10.4	13.5	15.1	15.0	16.7	18.7	20.8	23.2	25.8	28.6	31.7	-	-
355		2.8	3.3	7.0	7.9	8.7	9.8	10.4	11.7	15.2	17.0	16.9	18.8	21.1	23.5	26.1	29.0	-	-	-	-
400		3.2	3.8	7.9	8.9	9.8	11.0	11.7	13.1	17.1	19.1	19.1	21.3	23.7	26.3	29.4	32.6	-	-	-	-
450		3.6	4.2	8.8	9.9	11.0	12.3	13.2	14.8	19.2	21.4	21.5	23.9	26.7	29.6	-	-	-	-	-	-
500		4.0	4.6	9.8	11.0	12.3	13.8	14.6	16.3	21.4	23.8	23.9	26.5	29.7	32.9	-	-	-	-	-	-
560		4.4	5.1	11.0	12.3	13.7	15.3	16.4	18.3	23.9	26.5	26.7	29.6	-	-	-	-	-	-	-	-
630		5.0	5.7	12.3	13.8	15.4	17.2	18.4	20.5	26.9	29.8	30.0	33.2	-	-	-	-	-	-	-	-

Note: S = pipe series, SF = safety factor 2, PN = working pressure at 20°C for 50 years of service

*Suitable for water supply, sewerage and ducting applications

BSEN 1452-2 : Plastics Piping Systems (PVC-U)* - Metric Sizes

Nominal (minimum) Wall Thickness							
Nominal Outside Diameter	Pipe Series S						
	S 20 (SDR 41)	S 16 (SDR 33)	S 12.5 (SDR 26)	S 10 (SDR 21)	S 8 (SDR 17)	S 6.3 (SDR 13.6)	S 5 (SDR 11)
d_n (mm)	Nominal Pressure PN based on design coefficient C = 2.5						
		PN 6	PN 8	PN 10	PN 12.5	PN 16	PN 20
12	-	-	-	-	-	-	1.5
16	-	-	-	-	-	-	1.5
20	-	-	-	-	-	1.5	1.9
25	-	-	-	-	1.5	1.9	2.3
32	-	-	1.5	1.6	1.9	2.4	2.9
40	-	1.5	1.6	1.9	2.4	3.0	3.7
50	-	1.6	2.0	2.4	3.0	3.7	4.6
63	-	2.0	2.5	3.0	3.8	4.7	5.8
75	-	2.3	2.9	3.6	4.5	5.6	6.8
90	-	2.8	3.5	4.3	5.4	6.7	8.2
	Nominal Pressure PN based on design coefficient C = 2.0[a]						
	PN 6	PN 8	PN 10	PN 12.5	PN 16	PN 20	PN 25
110	2.7	3.4	4.2	5.3	6.6	8.1	10.0
125	3.1	3.9	4.8	6.0	7.4	9.2	11.4
140	3.5	4.3	5.4	6.7	8.3	10.3	12.7
160	4.0	4.9	6.2	7.7	9.5	11.8	14.6
180	4.4	5.5	6.9	8.6	10.7	13.3	16.4
200	4.9	6.2	7.7	9.6	11.9	14.7	18.2
225	5.5	6.9	8.6	10.8	13.4	16.6	-
250	6.2	7.7	9.6	11.9	14.8	18.4	-
280	6.9	8.6	10.7	13.4	16.6	20.6	-
315	7.7	9.7	12.1	15.0	18.7	23.2	-
355	8.7	10.9	13.6	16.9	21.1	26.1	-
400	9.8	12.3	15.3	19.1	23.7	29.4	-
450	11.0	13.8	17.2	21.5	26.7	33.1	-
500	12.3	15.3	19.1	23.9	29.7	36.8	-
560	13.7	17.2	21.4	26.7	-	-	-
630	15.4	19.3	24.1	30.0	-	-	-

[a] To apply a design coefficient of 2.5 (instead of 2.0) for pipes with nominal diameters above 90 mm, the next higher pressure rating, PN, shall be chosen.

Note 1: The nominal wall thicknesses conform to ISO 4065
Note 2: The PN 6 values for S 20 and S 16 are calculated with the preferred number 6,3.

*Suitable for water supply, sewerage and ducting applications

ISO 4422-2 : PVC-U Pipes for water supply-Superseded by ISO 1452-2 / BS EN ISO 1452

Nominal outside diameters d_n and nominal wall thickness e_n [based on an overall service (design) coefficient of C = 2.5]

Dimensions in millimeters

Nominal Outside Diameter d_n (mm)	Pipe Series S, SDR Series and Nominal Pressure PN Equivalents							
	S 20 SDR 41 PN 5	S 16.7 SDR 34.4 PN 6	S 16 SDR 33 PN 6.3	S 12.5 SDR 26 PN 8	S 10 SDR 21 PN 10	S 8 SDR 17 PN 12.5	S 6.3 SDR 13.6 PN 16	S 4 SDR 9 PN 25
	Nominal Wall Thickness, e_n							
10	-	-	-	-	-	-	-	1.5
12	-	-	-	-	-	-	-	1.5
16	-	-	-	-	-	-	1.5	1.8
20	-	-	-	-	-	-	1.5	2.3
25	-	-	-	-	-	1.5	1.9	2.8
32	-	-	-	-	1.6	1.9	2.4	3.6
40	-	-	1.5	1.6	1.9	2.4	3.0	4.5
50	-	-	1.6	2.0	2.4	3.0	3.7	5.6
63	1.6	1.9	2.0	2.5	3.0	3.8	4.7	7.1
75	1.9	2.2	2.3	2.9	3.6	4.5	5.6	8.4
90	2.2	2.7	2.8	3.5	4.3	5.4	6.7	10.1

Notes:

1 - S is the pipe series and equals $\frac{d_n - e_n}{2e_n}$

2- SDR is the standard dimension ratio and equals $\frac{d_n}{e_n}$

3- S and SDR are related by the equation [SDR] = 2[S] + 1

Nominal outside diameters d_n and nominal wall thickness e_n [based on an overall service (design) coefficient of C = 2.0]

Nominal Outside Diameter d_n (mm)	Pipe Series S, SDR Series and Nominal Pressure PN Equivalents						
	S 20 SDR 41 PN 6.3	S 16 SDR 33 PN 8	S 12.5 SDR 26 PN 10	S 10 SDR 21 PN 12.5	S 8 SDR 17 PN 16	S 6.3 SDR 13.6 PN 20	S 5 SDR 11 PN 25
	Nominal Wall Thickness, e_n						
110	2.7	3.4	4.2	5.3	6.6	8.1	10
125	3.1	3.9	4.8	6	7.4	9.2	11.4
140	3.5	4.3	5.4	6.7	8.3	10.3	12.7
160	4	4.9	6.2	7.7	9.5	11.8	14.6
180	4.4	5.5	6.9	8.6	10.7	13.3	16.4
200	4.9	6.2	7.7	9.6	11.9	14.7	18.2
225	5.5	6.9	8.6	10.8	13.4	16.6	-
250	6.2	7.7	9.6	11.9	14.8	18.4	-
280	6.9	8.6	10.7	13.4	16.6	20.6	-
315	7.7	9.7	12.1	15	18.7	23.2	-
355	8.7	10.9	13.6	16.9	21.1	26.1	-
400	9.8	12.3	15.3	19.1	23.7	29.4	-
450	11	13.8	17.2	21.5	26.7	33.1	-
500	12.3	15.3	19.1	23.9	29.7	36.8	-
560	13.7	17.2	21.4	26.7	-	-	-
630	15.4	19.3	24.1	30	-	-	-

Note - To aply an overall design (service) coefficient C of 2.5 for pipes with nominal diameters in this table, the next higher nominal pressure PN shall be selected, e.g an S 10 series pipe rated at PN 12.5 will be selected for PN 10 applications when a C of 2.5 is required.

Imperial Sizes:

BS 3505 : PVC-U Pressure Pipes for Cold Potable Water*

Nominal Size (inch)	Outside Diameter (mm)		Wall Thickness (mm)					
			Class C 9.0 bar		Class D 12.0 bar		Class E 15.0 bar	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
½"	21.20	21.50	-	-	-	-	1.70	2.10
¾"	26.60	26.90	-	-	-	-	1.90	2.50
1"	33.40	33.70	-	-	-	-	2.20	2.70
1 ¼"	42.10	42.40	-	-	2.20	2.70	2.70	3.20
1 ½"	48.10	48.40	-	-	2.50	3.00	3.10	3.70
2"	60.20	60.50	2.50	3.00	3.10	3.70	3.90	4.50
3"	88.70	89.10	3.50	4.10	4.60	5.30	5.70	6.60
4"	114.10	114.50	4.50	5.20	6.00	6.90	7.30	8.40
5"	140.00	140.40	5.50	6.40	7.30	8.40	9.00	10.40
6"	168.00	168.50	6.60	7.60	8.80	10.20	10.80	12.50
8"	218.80	219.40	7.80	9.00	10.30	11.90	12.60	14.50
10"	272.60	273.40	9.70	11.20	12.80	14.80	15.70	18.10
12"	323.40	324.30	11.50	13.30	15.20	17.50	18.70	21.60

Pressure ratings for working pressures at 20°C

Class	C	9.0 bar	130.0 lbf/in	300 ft head
Class	D	12.0 bar	173.0 lbf/in	400 ft head
Class	E	15.0 bar	217.0 lbf/in	500 ft head

BS 3506 : PVC-U Pressure Pipes For Industrial Uses*

Nominal Size	Mean Outside Diameter		Wall Thickness									
			Class O (non pressure)		Class B 6.0 bar*		Class C 9.0 bar*		Class D 12.0 bar*		Class E 15.0 bar*	
	MIN	MAX	Individual Value		Individual Value		Individual Value		Individual Value		Individual Value	
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Inches	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
½"	21.2	21.5	--	--	--	--	--	--	--	--	1.7	2.1
¾"	26.6	26.9	--	--	--	--	--	--	--	--	1.9	2.5
1"	33.4	33.7	--	--	--	--	--	--	--	--	2.2	2.7
1¼"	42.1	42.4	--	--	--	--	--	--	2.2	2.7	2.7	3.2
1½"	48.1	48.4	1.8	2.2	--	--	--	--	2.5	3.0	3.1	3.7
2"	60.2	60.5	1.8	2.2	--	--	2.5	3.0	3.1	3.7	3.9	4.5
2½"	75.0	75.3	1.8	2.2	--	--	3.0	3.5	3.9	4.5	4.8	5.5
3"	88.7	89.1	1.8	2.2	2.9	3.4	3.5	4.1	4.6	5.3	5.7	6.6
4"	114.1	114.5	2.3	2.8	3.4	4.0	4.5	5.2	6.0	6.9	7.3	8.4
5"	140.0	140.4	2.6	3.1	3.8	4.4	5.5	6.4	7.3	8.4	9.0	10.4
6"	168.0	168.5	3.1	3.7	4.5	5.2	6.6	7.6	8.8	10.2	10.8	12.5
7"	193.5	194.0	3.1	3.7	5.2	6.0	7.7	8.9	10.1	11.7	12.4	14.3
8"	218.8	219.4	3.1	3.7	5.3	6.1	7.8	9.0	10.3	11.9	12.6	14.5
9"	244.1	244.8	3.1	3.7	5.9	6.8	8.7	10.0	11.5	13.3	14.1	16.3
10"	272.6	273.4	3.1	3.7	6.6	7.6	9.7	11.2	12.8	14.8	15.7	18.1
12"	323.4	324.3	3.1	3.7	7.8	9.0	11.5	13.3	15.2	17.5	18.7	21.6

* 1 bar = 10^5 N/m^2 + Pipes to these nominal sizes are not normally available from stock.
Note 1 : The Pressures given at the top of the columns for Classes B,C,D and E are the maximum sustained working pressure for which the pipes are suitable and are based on water at a temperature of 20°C.

*Suitable for water supply, sewerage and ducting applications

ISO 9001

ASTM D 1785 : Polyvinyl Chloride (PVC) Pipes SCH 40/SCH 80*

Nominal Size (inch)	Outside Diameter (mm)		SCH 40			SCH 80		
			Wall Thickness (mm)		Pressure Rating (BAR)	Wall Thickness (mm)		Pressure Rating (BAR)
	MIN	MAX	MIN	MAX		MIN	MAX	
½"	21.24	21.44	2.77	3.28	41.40	3.73	4.24	58.60
¾"	26.57	26.77	2.87	3.38	33.10	3.91	4.42	47.60
1"	33.27	33.53	3.38	3.89	31.00	4.55	5.08	43.40
1¼"	42.03	42.29	3.56	4.07	25.50	4.85	5.43	35.90
1½"	48.11	48.41	3.68	4.19	22.80	5.08	5.69	32.40
2"	60.17	60.47	3.91	4.42	19.30	5.54	6.20	27.60
2½"	72.84	73.20	5.16	5.77	20.70	7.01	7.85	29.00
3"	88.70	89.10	5.49	6.15	17.90	7.62	8.53	25.50
4"	114.07	114.53	6.02	6.73	15.20	8.56	9.58	22.10
6"	168.00	168.56	7.11	7.97	12.40	10.97	12.29	19.30
8"	218.70	219.46	8.18	9.17	11.00	12.70	14.22	17.20
10"	272.67	273.43	9.27	10.39	9.70	15.06	16.87	15.90
12"	323.47	324.23	10.31	11.55	9.00	17.45	19.53	15.90

Pressure rating based on water at 23°C for unthreaded pipes.

ASTM D 2241 : PVC Pressure Pipes (SDR Series)*

Nominal Size (In)	Mean Outside Diameter (mm)		Wall Thickness (mm)													
			PN 4.3 bar		PN 6.9 bar		PN 8.6 bar		PN 11 bar		PN 13.8 bar		PN 17.2 bar		PN 21.7 bar	
			SDR 64		SDR 41		SDR 32.5		SDR 26		SDR 21		SDR 17		SDR 13.5	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
1/2"	21.24	21.44	-	-	-	-	-	-	-	-	-	-	-	-	1.575	2.083
3/4"	26.57	26.77	-	-	-	-	-	-	-	-	1.524	2.032	1.575	2.083	1.981	2.489
1"	33.27	33.53	-	-	-	-	-	-	1.524	2.032	1.600	2.108	1.956	2.464	2.464	2.972
1¼"	42.03	42.29	-	-	-	-	1.524	2.032	1.626	2.134	2.007	2.515	2.489	2.997	3.124	3.632
1½"	48.11	48.41	-	-	-	-	1.524	2.032	1.854	2.362	2.286	2.794	2.845	3.353	3.581	4.089
2"	60.17	60.47	-	-	-	-	1.854	2.362	2.311	2.819	2.870	3.378	3.556	4.064	4.470	4.978
2½"	72.84	73.20	-	-	-	-	2.235	2.743	2.794	3.302	3.480	3.988	4.293	4.801	5.410	6.071
3"	88.70	89.10	-	-	2.159	2.667	2.743	3.251	3.429	3.937	4.242	4.750	5.232	5.867	6.579	7.366
3½"	101.40	101.80	-	-	2.489	2.997	3.124	3.632	3.912	4.420	4.826	5.410	5.969	6.680	7.518	8.433
4"	114.07	114.53	1.778	2.286	2.794	3.302	3.505	4.013	4.394	4.902	5.436	6.096	6.731	7.544	8.458	9.474
5"	141.05	141.55	2.210	2.718	3.454	3.962	4.343	4.877	5.436	6.121	6.731	7.544	8.306	9.296	10.465	11.709
6"	168.00	168.56	2.642	3.150	4.115	4.623	5.182	5.791	6.477	7.264	8.026	8.992	9.906	11.100	12.471	13.970
8"	218.70	219.46	3.429	3.937	5.334	5.969	6.731	7.544	8.433	9.449	10.414	11.659	12.903	14.453	-	-
10"	272.67	273.43	4.267	4.775	6.655	7.442	8.407	9.423	10.490	11.76	12.979	14.529	16.053	17.983	-	-
12"	323.47	324.23	5.055	5.664	7.899	8.839	9.957	11.151	12.446	13.945	15.392	17.247	19.050	21.336	-	-

*Suitable for water supply, sewerage and ducting applications

BSEN 1452 : Plastic Piping Systems (PVC-U)* - Imperial Sizes

Nominal Size (inch)	Outside Diameter (mm)		Wall Thickness (mm)		Wall Thickness (mm)		Wall Thickness (mm)	
			PN 9 (Class C)		PN 12 (Class D)		PN 15 (Class E)	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
½”	21.2	21.5	-	-	-	-	1.7	2.1
¾”	26.6	26.9	-	-	-	-	1.9	2.5
1”	33.4	33.7	-	-	-	-	2.2	2.8
1¼”	42.1	42.4	-	-	2.2	2.7	2.7	3.3
1½”	48.1	48.4	-	-	2.5	3.0	3.1	3.7
2”	60.2	60.5	2.5	3.0	3.1	3.7	3.9	4.5
3”	88.7	89.1	3.5	4.1	4.6	5.3	5.7	6.6
4”	114.1	114.5	4.5	5.2	6.0	6.9	7.3	8.4
6”	168.0	168.5	6.6	7.6	8.8	10.2	10.8	12.5
8”	218.8	219.4	7.8	9.0	10.3	11.9	12.6	14.5
10”	272.6	273.4	9.7	11.2	12.8	14.8	15.7	18.1
12”	323.4	324.3	11.5	13.3	15.2	17.5	18.7	21.6

*Suitable for water supply, sewerage and ducting applications

UPVC AC Drain Pipe – Non Standard

Nominal Size (inch)	Outside Diameter (mm)		Inside Diameter (mm)		Wall Thickness (mm)	
	MIN	MAX	MIN	MAX	MIN	MAX
½”	21.20	21.50	17.80	18.90	1.30	1.70
¾”	26.60	26.90	22.90	24.00	1.45	1.85
1”	33.27	33.70	29.07	30.30	1.70	2.10

- Suitable for AC Drain Application
- Standard length 4 meters
- White colour

PVC Ducts and Conduits:

NEMA TC 2 : Electrical PVC-U Tubing and Conduits:

This covers the following type of Electrical Polyvinyl Chloride (PVC) conduit (EPC).

EPC-40-PVC = Electrical PVC conduit designed for normal duty (Schedule-40) applications above ground; also used for all concrete encased applications or direct burial.

EPC-80-PVC = Electrical PVC conduit designed for heavy duty (Schedule-80) applications above ground; also udsed for all concrete encased applications or direct burial.

Nominal Pipe Size (in)	Average Outside Diameter (mm)	Minimum Wall Thickness (mm)	
		EPC - 40 - PVC	EPC - 80 - PVC
½"	21.34	2.77	3.73
¾"	26.67	2.87	3.91
1"	33.4	3.38	4.55
1¼"	42.16	3.56	4.85
1½"	48.26	3.68	5.08
2"	60.32	3.91	5.54
2½"	73.02	5.16	7.01
3"	88.90	5.49	7.62
3½"	101.6	5.74	8.08
4"	114.3	6.02	8.56
5"	141.3	6.55	9.52
6"	168.28	7.11	10.97
8"	219.00	8.18	12.70

NEMA TC 6 & 8 : PVC-U Duct Pipe for Underground Installations

Nominal Pipe Size (in)	Average Outside Diameter (mm)	Minimum Wall Thickness (mm)				
		EB - 20	EB - 35	DB - 60	DB - 100	DB - 120
1"	33.81	-	-	-	-	1.52
1½"	48.26	-	-	1.52	-	1.65
2"	60.33	-	1.52	1.65	-	2.11
3"	88.90	1.70	2.08	2.54	3.07	3.23
3½"	101.60	1.98	2.41	2.92	3.51	3.73
4"	114.30	2.26	2.77	3.33	3.94	4.22
5"	141.30	2.84	3.45	4.17	4.88	5.21
6"	168.28	3.43	4.17	4.98	5.82	6.20
EB - Encased Burial Duct, DB - Direct Burial Duct						

These covers the following types of plastic utilities duct for installation underground for communications and electrical wire and cable.

Type EB -20 Designed for burial encased in concrete
Type EB -35 Designed for burial encased in concrete
Type DB -60 Designed for direct burial without encasement in concrete
Type DB -100 Designed for direct burial without encasement in concrete
Type DB -120 Designed for direct burial without encasement in concrete
Type DB products are also used for concrete encased applications.

PVC-U Duct Pipes for Electrical and Telephone Cables

Duct No.	Avg. Outside Diameter	Wall Thickness	
mm	mm	Min (mm)	Max (mm)
54 - D	96.5	3.25	3.65
56	53.9	1.55	1.70
57	114.5	3.40	3.80

Stocks are available with plain ends or with sockets. Standard Length: 6 meters. Colour available: Black

uPVC Fittings / Imperial Sizes

Solvent Welding Fittings to EN1452 And ASTMD 2467/2464 SCH 80

COUPLING

CODE	SIZE	QTY/CTN
PVC-80-CO-0.5	½"	405
PVC-80-CO-0.75	¾"	235
PVC-80-CO-1.0	1"	336
PVC-80-CO-1.25	1¼"	119
PVC-80-CO-1.5	1½"	140
PVC-80-CO-2.0	2"	81
PVC-80-CO-2.5	2½"	54
PVC-80-CO-3.0	3"	36
PVC-80-CO-4.0	4"	14
PVC-80-CO-6.0	6"	12
PVC-80-CO-8.0	8"	8
PVC-80-CO-10.0	10"	1
PVC-80-CO-12.0	12"	1

45˚ ELBOW

CODE	SIZE	QTY/CTN
PVC-80-EB45-0.5	½"	540
PVC-80-EB45-0.75	¾"	340
PVC-80-EB45-1.0	1"	185
PVC-80-EB45-1.25	1¼"	109
PVC-80-EB45-1.5	1½"	90
PVC-80-EB45-2.0	2"	48
PVC-80-EB45-2.5	2½"	30
PVC-80-EB45-3.0	3"	20
PVC-80-EB45-4.0	4"	10
PVC-80-EB45-6.0	6"	7
PVC-80-EB45-8.0	8"	4
PVC-80-EB45-10.0	10''	1
PVC-80-EB45-12.0	12''	1

90˚ ELBOW

CODE	SIZE	QTY/CTN
PVC-80-EB90-0.5	½"	510
PVC-80-EB90-0.75	¾"	310
PVC-80-EB90-1	1"	180
PVC-80-EB90-1.25	1¼"	99
PVC-80-EB90-1.5	1½"	69
PVC-80-EB90-2.0	2"	41
PVC-80-EB90-5.5	2½"	36
PVC-80-EB90-3	3"	14
PVC-80-EB90-4	4"	12
PVC-80-EB90-6	6"	5
PVC-80-EB90-8	8"	4
PVC-80-EB90-10	10''	1
PVC-80-EB90-12	12''	1

EQUAL TEE

CODE	SIZE	QTY/CTN
PVC-80-TE-0.5	½"	330
PVC-80-TE-0.75	¾"	201
PVC-80-TE-1.0	1"	119
PVC-80-TE-1.25	1¼"	70
PVC-80-TE-1.5	1½"	52
PVC-80-TE-2.0	2"	30
PVC-80-TE-2.5	2½"	22
PVC-80-TE-3.0	3"	18
PVC-80-TE-4.0	4"	10
PVC-80-TE-6.0	6"	4
PVC-80-TE-8.0	8"	3
PVC-80-TE-10.0	10''	1
PVC-80-TE-12.0	12''	1

Solvent Welding Fittings to EN1452 And ASTMD 2467/2464 SCH 80 (Continue)

REDUCING TEE

CODE	SIZE	QTY/CTN
PVC-80-RT-0.75/0.5	¾" x½"	230
PVC-80-RT-1.0/0.5	1" x½"	159
PVC-80-RT-1.0/0.75	1" x¾"	152
PVC-80-RT-1.25/0.75	1¼" x¾"	95
PVC-80-RT-1.25/1.0	1¼" x 1"	82
PVC-80-RT-1.5/1.0	1½" x 1"	56
PVC-80-RT-1.5/1.25	1½" x 1¼"	48
PVC-80-RT-2.0/1.25	2" x 1¼"	36
PVC-80-RT-2.0/1.5	2" x 1½"	36
PVC-80-RT-2.5/1.5	2½" x 1½"	28
PVC-80-RT-2.5/2.0	2½" x 2"	21
PVC-80-RT-3.0/2.0	3" x 2"	20
PVC-80-RT-3.0/2.5	3" x 2½"	20
PVC-80-RT-4.0/3.0	4" x 3"	16

END CAP

CODE	SIZE	QTY/CTN
PVC-80-EC-0.5	½"	1,200
PVC-80-EC-0.75	¾"	900
PVC-80-EC-1.0	1"	486
PVC-80-EC-1.25	1¼"	320
PVC-80-EC-1.5	1½"	200
PVC-80-EC-2.0	2"	140
PVC-80-EC-2.5	2½"	98
PVC-80-EC-3.0	3"	90
PVC-80-EC-4.0	4"	48
PVC-80-EC-6.0	6"	18
PVC-80-EC-8.0	8"	9
PVC-80-EC-10.0	10''	2
PVC-80-EC-12.0	12''	2

REDUCING BUSH

CODE	SIZE	QTY/CTN
PVC-80-RB-0.75/0.5	¾" x½"	693
PVC-80-RB-1.0/0.5	1" x½"	378
PVC-80-RB-1.0/0.75	1" x¾"	378
PVC-80-RB-1.25/0.5	1¼" x½"	280
PVC-80-RB-1.25/0.75	1¼" x¾"	280
PVC-80-RB-1.25/1.0	1¼" x 1"	280
PVC-80-RB-1.5/0.75	1½" x¾"	210
PVC-80-RB-1.5/1.25	1½" x 1¼"	210
PVC-80-RB-2.0/0.5	2" x½"	140
PVC-80-RB-2.0/0.75	2" x¾"	140
PVC-80-RB-2.0/1.0	2" x 1"	140
PVC-80-RB-2.0/1.5	2" x 1½"	140
PVC-80-RB-2.0/1.25	2" x 1¼"	140
PVC-80-RB-2.5/1.5	2½"x1½"	100
PVC-80-RB-2.5/2.0	2½"x 2"	120
PVC-80-RB-3.0/2.0	3" x 2"	84
PVC-80-RB-3.0/2.5	3" x 2½"	60
PVC-80-RB-4.0/3.0	4" x 3"	32
PVC-80-RB-6.0/4.0	6" x 4"	32
PVC-80-RB-8.0/6.0	8" x 6"	12
PVC-80-RB-10.0/8.0	10" x 8"	4
PVC-80-RB-12 0/10 0	12" x 10"	3

Solvent Welding Fittings to EN1452 And ASTMD 2467/2464 SCH 80 (Continue)

FLANGE ADAPTER & RING

CODE	SIZE (mm)	QTY/CTN	No. of Holes
PVC-80-FG-2.0	2"	45	4
PVC-80-FG-2.5	2 ½"	24	4
PVC-80-FG-3.0	3"	24	4
PVC-80-FG-4.0	4"	16	8
PVC-80-FG-6.0	6"	10	8
PVC-80-FG-8.0	8"	6	8
PVC-80-FG-10.0	10"	3	12
PVC-80-FG-12.0	12"	2	12

FEMALE THREADED END CAP

CODE	SIZE	QTY/CTN
PVC-80-FC-0.5	1 ½"	1,728
PVC-80-FC-0.5	2"	1,190
PVC-80-FC-0.5	3"	420
PVC-80-FC-0.5	4"	230
PVC-80-FC-0.5	½"	72
PVC-80-FC-0.75	¾"	36

MALE THREADED PLUG

CODE	SIZE	QTY/CTN
PVC-80-MC-0.5	½"	1200
PVC-80-MC-0.75	¾"	700
PVC-80-MC-1.0	1"	375
PVC-80-MC-1.25	1¼"	420
PVC-80-MC-1.5	1½"	315
PVC-80-MC-2.0	2"	168

FEMALE THREADED ELBOW

CODE	SIZE	QTY/CTN
PVC-80-FE-0.5	½"	410
PVC-80-FE-0.75	¾"	260
PVC-80-FE-1.0	1"	180

UNION

CODE	SIZE	QTY/CTN
PVC-80-UN-0.5	½"	270
PVC-80-UN-0.75	¾"	245
PVC-80-UN-1.0	1"	125
PVC-80-UN-1.25	1¼"	80
PVC-80-UN-1.5	1½"	100
PVC-80-UN-2.0	2"	48
PVC-80-UN-2.5	2½"	18
PVC-80-UN-3.0	3"	18
PVC-80-UN-4.0	4"	12

Y BRANCH`

CODE	SIZE	QTY/CTN
PVC-PN15-YBR-2.0	2"	35
PVC-PN15-YBR-3.0	3"	15
PVC-PN15-YBR-4.0	4"	8

Solvent Welding Fittings to EN1452 And ASTMD 2467/2464 SCH 80 (Continue)

MALE THREADED ADAPTER

CODE	SIZE	QTY/CTN
PVC-80-MA-0.5	½"	664
PVC-80-MA-0.75	¾"	385
PVC-80-MA-1.0	1"	252
PVC-80-MA-1.25	1¼"	150
PVC-80-MA-1.5	1½"	195
PVC-80-MA-2.0	2"	130
PVC-80-MA-2.5	2½"	60
PVC-80-MA-3.0	3"	48
PVC-80-MA-4.0	4"	18

FEMALE THREADED ADAPTER

CODE	SIZE	QTY/CTN
PVC-80-FA-0.5	½"	400
PVC-80-FA-0.75	¾"	233
PVC-80-FA-1.0	1"	144
PVC-80-FA-1.25	1¼"	198
PVC-80-FA-1.5	1½"	139
PVC-80-FA-2.0	2"	72
PVC-80-FA-2.5	2½"	45
PVC-80-FA-3.0	3"	36
PVC-80-FA-4.5	4"	12

MALE ADAPTER WITH BRASS THREAD

CODE	SIZE	QTY/CTN
PVC-80-BMA-0.5	½"	664
PVC-80-BMA-0.75	¾"	385
PVC-80-BMA-1.0	1"	252
PVC-80-BMA-1.25	1¼"	150
PVC-80-BMA-1.5	1½"	195
PVC-80-BMA-2.0	2"	130

FEMALE ADAPTER WITH BRASS THREAD

SIZE	SIZE	QTY/CTN
PVC-80-BFA-0.5	½"	200
PVC-80-BFA-0.75	¾"	200

FEMALE ELBOW WITH BRASS THREAD

CODE	SIZE	QTY/CTN
PVC-80-BFE-0.5	½"	180
PVC-80-BFE-0.75	¾"	144

FEMALE TEE WITH BRASS THREAD

CODE	SIZE	QTY/CTN
PVC-80-BFT-0.5	½"	110
PVC-80-BFT-0.75	¾"	90

Solvent Welding Fittings to ASTMD 2466 SCH 40

REDUCING COUPLING

CODE	SIZE	QTY/CTN
PVC-40-RC-0.75/0.5	¾" x½"	408
PVC-40-RC-1.0/0.75	1" x¾"	294
PVC-40-RC-1.25/1.0	1¼" x 1"	360
PVC-40-RC-1.25/0.75	1¼" x¾"	399
PVC-40-RC-1.5/1.25	1½" x 1¼"	170
PVC-40-RC-1.5/1.0	1½" x 1"	264
PVC-40-RC-2.0/1.5	2" x 1½"	154
PVC-40-RC-2.0/1.25	2" x 1¼"	168
PVC-40-RC-2.5/2.0	2½" x 2"	63
PVC-40-RC-2.5/1.5	2½" x 1½	76
PVC-40-RC-3.0/2.5	3" x 2½"	100
PVC-40-RC-3.0/2.0	3" x 2"	100
PVC-40-RC-4.0/3.0	4" x 3"	48
PVC-40-RC-4.0/2.5	4" x 2½"	56

COUPLER

CODE	SIZE	QTY/CTN
PVC-40-CO-0.5	½"	720
PVC-40-CO-0.75	¾"	480
PVC-40-CO-1.0	1	270
PVC-40-CO-1.25	1¼"	175
PVC-40-CO-1.5	1½"	112
PVC-40-CO-2.0	2"	80
PVC-40-CO-2.5	2½"	110
PVC-40-CO-3.0	3"	54
PVC-40-CO-4.0	4"	36

45⁰ ELBOW

CODE	SIZE	QTY/CTN
PVC-40-EB -0.5	½"	540
PVC-40-EB -0.75	¾"	360
PVC-40-EB -1.0	1"	150
PVC-40-EB -1.25	1¼"	100
PVC-40-EB -1.5	1½"	80
PVC-40-EB -2.0	2"	40
PVC-40-EB -2.5	2½"	30
PVC-40-EB -3.0	3"	36
PVC-40-EB -4.0	4"	16

90⁰ ELBOW

CODE	SIZE	QTY/CTN
PVC-40-EB -0.5	½"	400
PVC-40-EB -0.75	¾"	280
PVC-40-EB -1.0	1	150
PVC-40-EB -1.25	1¼"	90
PVC-40-EB -1.5	1½"	60
PVC-40-EB -2.0	2"	30
PVC-40-EB -2.5	2½"	24
PVC-40-EB -3.0	3"	24
PVC-40-EB -4.0	4"	16

MALE THREADED PLUG

CODE	SIZE	QTY/CTN
PVC-40-MC-0.5	½"	4000
PVC-40-MC-0.75	¾"	2500
PVC-40-MC-1.0	1	1300
PVC-40-MC-1.25	1¼"	315
PVC-40-MC-1.5	1½"	168
PVC-40-MC-2.5	2"	168

ISO 9001

Solvent Welding Fittings to ASTMD 2466 SCH 40 (Continue)

TEE

CODE	SIZE	QTY/CTN
PVC-40-TE-0.5	½"	300
PVC-40-TE-0.75	¾"	200
PVC-40-TE-1.0	1"	100
PVC-40-TE-1.25	1¼"	60
PVC-40-TE-1.5	1½"	45
PVC-40-TE-2.0	2"	28
PVC-40-TE-3.0	3"	20
PVC-40-TE-4.0	4"	12

REDUCING TEE

CODE	SIZE	QTY/CTN
PVC-40-RT-0.75/0.5	¾" x½"	200
PVC-40-RT-1.0/0.5	1" x½"	108
PVC-40-RT-1.0/0.75	1" x¾"	108
PVC-40-RT-1.25/0.75	1¼" x¾"	60
PVC-40-RT-1.25/1.0	1¼" x 1"	60
PVC-40-RT-1.5/0.75	1½ x ¾"	48
PVC-40-RT-1.5/1.0	1½ x 1"	48
PVC-40-RT-1.5/1.25	1½ x1¼"	71
PVC-40-RT-2.0/1.25	2 x 1¼"	110
PVC-40-RT-2.0/1.5	2 x 1½"	100
PVC-40-RT-2.5/1.5	2½ x1½"	50
PVC-40-RT-2.5/2.0	2½ x 2"	42
PVC-40-RT-3.0/2.0	3 x 2"	30
PVC-40-RT-3.0/2.5	3 x 2½"	27
PVC-40-RT-4.0/2.5	4 x 2½"	20
PVC-40-RT-4.0/3.0	4 x 3	16

MALE THREADED ADAPTER

CODE	SIZE	QTY/CTN
PVC-40-MA-0.5	½"	936
PVC-40-MA-0.75	¾"	490
PVC-40-MA-1.0	1"	360
PVC-40-MA-1.25	1¼"	200
PVC-40-MA-1.5	1½"	120
PVC-40-MA-2.0	2"	75
PVC-40-MA-3.0	3"	48
PVC-40-MA-4.0	4"	28

FEMALE THREADED ADAPTER

CODE	SIZE	QTY/CTN
PVC-40-FA-0.5	½"	560
PVC-40-FA-0.75	¾"	360
PVC-40-FA-1.0	1"	240
PVC-40-FA-1.25	1¼"	150
PVC-40-FA-1.5	1½"	96
PVC-40-FA-2.0	2"	60
PVC-40-FA-2.5	2½"	90
PVC-40-FA-3.0	3"	60

Solvent Welding Fittings to ASTMD 2466 SCH 40 (Continue)

REDUCING BUSH

CODE	SIZE	QTY/CTN
PVC-40-RB-0.75/0.5	¾" x ½"	693
PVC-40-RB-1.0/0.5	1" x ½"	378
PVC-40-RB-1.0/0.75	1" x ¾"	378
PVC-40-RB-1.25/0.5	1¼" x ½"	280
PVC-40-RB-1.25/0.75	1¼" x ¾"	280
PVC-40-RB-1.25/1.0	1¼" x 1"	280
PVC-40-RB-1.25/1.5	1¼" x 1½"	210
PVC-40-RB-1.5/0.75	1½" x ¾"	210
PVC-40-RB-1.5/1.0	1½ "x 1"	210
PVC-40-RB-2.0/0.5	2 x ½"	140
PVC-40-RB-2.0/0.75	2 x ¾"	140
PVC-40-RB-2.0/1.0	2 x 1"	140
PVC-40-RB-2.0/1.5	2" x 1½"	140
PVC-40-RB-2.0/1.25	2 x 1¼"	140
PVC-40-RB-3.5/2.5	3" x 2½"	60

FEMALE THREADED ELBOW

CODE	SIZE	QTY/CTN
PVC-40-FE-0.5	½"	400
PVC-40-FE-0.75	¾"	280
PVC-40-FE-1.0	1"	150
PVC-40-FE-0.75/0.5	¾" x ½"	280
PVC-40-FE-1.0/0.75	1" x ¾"	200
PVC-40-FE-1.0/0.5	1" x ½"	200

MALE THREADED ELBOW

CODE	SIZE	QTY/CTN
PVC-40-ME-0.5	½"	400
PVC-40-ME-0.75	¾"	360
PVC-40-ME-1.0	1"	700

FEMALE THREADED TEE

CODE	SIZE	QTY/CTN
PVC-40-FT-0.5	½"	300
PVC-40-FT-0.75	¾"	200
PVC-40-FT-1.0	1"	100
PVC-40-FT-0.75/0.5	¾" x ½"	200
PVC-40-FT-1.0/0.75	1" x ¾"	100
PVC-40-FT-1.0/0.5	1" x ½"	100
PVC-40-FT- 1.25	1¼"	90
PVC-40-FT- 2.0	2"	12

Solvent Welding Fittings to ASTMD 2466 SCH 40 (Continue)

FEMALE THREADED END CAP

CODE	SIZE	QTY/CTN
PVC-40-FC-0.5	½"	1200
PVC-40-FC-0.75	¾"	900

CROSS

CODE	SIZE	QTY/CTN
PVC-40-CR-0.5	½"	200
PVC-40-CR-0.75	¾"	160
PVC-40-CR-1.0	1"	72

END CAP

CODE	SIZE	QTY/CTN
PVC-40-EC-0.5	½"	1200
PVC-40-EC-0.75	¾"	900
PVC-40-EC-1.0	1"	486
PVC-40-EC-1.25	1¼"	320
PVC-40-EC-1.5	1½"	200
PVC-40-EC-2.0	2"	140
PVC-40-EC-2.5	2½"	98
PVC-40-EC-3.0	3"	90

REDUCING 90° ELBOW

CODE	SIZE	QTY/CTN
PVC-40-RE-0.75/0.5	¾" x ½"	280
PVC-40-RE-1.0/0.5	1" x ½"	200

DOUBLE UNION BALL VALVE

CODE	SIZE	QTY/CTN
PVC-SS-DUBV-0.5	½"	64
PVC-SS-DUBV-0.75	¾"	56
PVC-SS-DUBV-1.0	1"	36
PVC-SS-DUBV-1.25	1¼"	30
PVC-SS-DUBV-1.5	1½"	16
PVC-SS-DUBV-2.0	2"	8
PVC-SS-DUBV-2.5	2½"	8
PVC-SS-DUBV-3.0	3"	4
PVC-SS-DUBV-4.0	4"	2

SINGLE UNION BALL VALVE

CODE	SIZE	QTY/CTN
PVC-80-SUBV-0.5	½"	120
PVC-80-SUBV-1.0	1"	30
PVC-80-SUBV-1.25	1¼"	42
PVC-80-SUBV-1.5	1½"	20
PVC-80-SUBV-2.0	2"	20

uPVC Fittings / Metric Sizes

Solvent Welding Fitting, PN16 to DIN 8063 and EN1452

90° ELBOW, SOLVENT WELDING

CODE	SIZE (mm)	QTY/CTN
PVC-SS-E90-20	20	1000
PVC-SS-E90-25	25	600
PVC-SS-E90-32	32	300
PVC-SS-E90-40	40	192
PVC-SS-E90-50	50	100
PVC-SS-E90-63	63	50
PVC-SS-E90-75	75	24
PVC-SS-E90-90	90	36
PVC-SS-E90-110	110	18
PVC-SS-E90-160	160	5
PVC-SS-E90-200	200	3
PVC-SS-E90-225	225*	2
PVC-SS-E90-250	250*	2
PVC-SS-E90-280	280	2
PVC-SS-E90-315	315	1
PVC-SS-E90-355	355*	1
PVC-SS-E90-400	400*	1

45° ELBOW, SOLVENT WELDING

CODE	SIZE (mm)	QTY/CTN
PVC-SS-E45-20	20	1250
PVC-SS-E45-25	25	800
PVC-SS-E45-32	32	400
PVC-SS-E45-40	40	135
PVC-SS-E45-50	50	120
PVC-SS-E45-63	63	50
PVC-SS-E45-75	75	30
PVC-SS-E45-90	90	48
PVC-SS-E45-110	110	24
PVC-SS-E45-160	160	4
PVC-SS-E45-200	200	2
PVC-SS-E45-225	225*	2
PVC-SS-E45-250	250	2
PVC-SS-E45-280	280*	2
PVC-SS-E45-315	315	1
PVC-SS-E45-355	355*	1
PVC-SS-E45-400	400*	1

COUPLER, SOLVENT WELDING

CODE	SIZE (mm)	QTY/CTN
PVC-SS-CO-20	20	1750
PVC-SS-CO-25	25	800
PVC-SS-CO-32	32	550
PVC-SS-CO-40	40	288
PVC-SS-CO-50	50	198
PVC-SS-CO-63	63	80
PVC-SS-CO-75	75	56
PVC-SS-CO-90	90	54
PVC-SS-CO-110	110	36
PVC-SS-CO-160	160	12
PVC-SS-CO-200	200	4
PVC-SS-CO-225	225	4
PVC-SS-CO-250	250	2
PVC-SS-CO-280	280*	2
PVC-SS-CO-315	315*	2
PVC-SS-CO-355	355*	1
PVC-SS-CO-400	400*	1

*PN10

Solvent Welding Fitting, PN16 (Continue)

MALE ADAPTER, SOLVENT WELDING

CODE	SIZE (mm)	QTY/CTN
PVC-SS-MA-20	1/2"X20mm	1700
PVC-SS-MA-25	3/4"X25mm	800
PVC-SS-MA-32	1"x32mm	500
PVC-SS-MA-40	11/4"X40mm	225
PVC-SS-MA-50	11/2"X50mm	216
PVC-SS-MA-63	2"X63mm	105
PVC-SS-MA-75	21/2"X75mm	45
PVC-SS-MA-90	3"X90mm	40
PVC-SS-MA-110	4"X110mm	36

FEMALE ADAPTER, SOLVENT WELDING

CODE	SIZE (mm)	QTY/CTN
PVC-SS-FA-20	1/2"X20mm	1500
PVC-SS-FA-25	3/4"X25mm	500
PVC-SS-FA-32	1"x32mm	550
PVC-SS-FA-40	11/4"X40mm	360
PVC-SS-FA-50	11/2"X50mm	162
PVC-SS-FA-63	2"X63mm	105
PVC-SS-FA-75	21/2"X75mm	8
PVC-SS-FA-90	3"X90mm	30
PVC-SS-FA-110	4"X110mm	3

EQUAL TEE, SOLVENT WELDING

CODE	SIZE (mm)	QTY/CTN
PVC-SS-T-20	20	700
PVC-SS-T-25	25	400
PVC-SS-T-32	32	250
PVC-SS-T-40	40	128
PVC-SS-T-50	50	70
PVC-SS-T-63	63	34
PVC-SS-T-75	75	42
PVC-SS-T-90	90	25
PVC-SS-T-110	110	15
PVC-SS-T-160	160	4
PVC-SS-T-200	200	2
PVC-SS-T-225	225	2
PVC-SS-T-250	250	1
PVC-SS-T-280	280*	1
PVC-SS-T-315	315*	1
PVC-SS-T-355	355*	1
PVC-SS-T-400	400*	1

*PN10

Solvent Welding Fitting, PN16 (Continue)

REDUCING TEE, SOLVENT WELDING

CODE	SIZE (mm)	QTY/CTN
PVC-SS-RT-2520	25x20	400
PVC-SS-RT-3225	32x25	200
PVC-SS-RT-4025	40x25	125
PVC-SS-RT-4032	40x32	144
PVC-SS-RT-5032	50x32	75
PVC-SS-RT-6332	63x32	40
PVC-SS-RT-6350	63x50	40
PVC-SS-RT-9063	90x63	30
PVC-SS-RT-11050	110x50	15
PVC-SS-RT-11063	110x63	15
PVC-SS-RT-11090	110x90	15
PVC-SS-RT-225110	225x110	1
PVC-SS-RT-225160	225x160	1
PVC-SS-RT-280250	280x250*	1

END CAP, SOLVENT WELDING

CODE	SIZE (mm)	QTY/CTN
PVC-SS-EC-20	20	2800
PVC-SS-EC-25	25	1500
PVC-SS-EC-32	32	900
PVC-SS-EC-40	40	500
PVC-SS-EC-50	50	330
PVC-SS-EC-63	63	175
PVC-SS-EC-75	75	106
PVC-SS-EC-90	90	60
PVC-SS-EC-110	110	27
PVC-SS-EC-160	160	18
PVC-SS-EC-200	200	8
PVC-SS-EC-225	225	4
PVC-SS-EC-250	250	4
PVC-SS-EC-315	315	2
PVC-SS-EC-355	355*	2
PVC-SS-EC-400	400*	2

FEMALE THREADED END CAP, SOLVENT WELDING

CODE	SIZE (mm)	QTY/CTN
PVC-SS-FC-0.5	1/2”	1728
PVC-SS-FC-0.75	3/4”	1190
PVC-SS-FC-1.5	11/2”	420
PVC-SS-FC-2	2”	230
PVC-SS-FC-3	3”	72
PVC-SS-FC-4	4”	36

*PN10

ISO 9001

Solvent Welding Fitting, PN16 (Continue)

REDUCER BUSH, SOLVENT WELDING

CODE	SIZE (mm)	QTY/CTN
PVC-SS-RB-2520	25x20	3500
PVC-SS-RB-3220	32x20	2000
PVC-SS-RB-3225	32x25	2000
PVC-SS-RB-4020	40x20	600
PVC-SS-RB-4025	40x25	600
PVC-SS-RB-4032	40x32	1000
PVC-SS-RB-5020	50x20	608
PVC-SS-RB-5025	50x25	608
PVC-SS-RB-5032	50x32	576
PVC-SS-RB-5040	50x40	576
PVC-SS-RB-6332	63x32	300
PVC-SS-RB-6350	63x50	300
PVC-SS-RB-7550	75x50	160
PVC-SS-RB-7563	75x63	90
PVC-SS-RB-9050	90x50	112
PVC-SS-RB-9063	90x63	112
PVC-SS-RB-9075	90x75	60
PVC-SS-RB-11063	110x63	54
PVC-SS-RB-11075	110x75	54
PVC-SS-RB-11090	110x90	60
PVC-SS-RB-16090	160x90	32
PVC-SS-RB-160110	160x110	32
PVC-SS-RB-200160	200x160	20
PVC-SS-RB-225160	225x160	8
PVC-SS-RB-225200	225x200	8
PVC-SS-RB-250160	250x160	8
PVC-SS-RB-250200	250x200	8
PVC-SS-RB-250225	250x225	8
PVC-SS-RB-280225	280x225	6
PVC-SS-RB-315225	315x225	4
PVC-SS-RB-315250	315x250	4
PVC-SS-RB-315280	315x280	4
PVC-SS-RB-355315	355x315*	3
PVC-SS-RB-400315	400x315*	2
PVC-SS-RB-400355	400x355*	2

MALE THREADED END CAP

CODE	SIZE (mm)	QTY/CTN
PVC-SS-MC-0.5	1/2”	1200
PVC-SS-MC-0.75	3/4”	700
PVC-SS-MC-1	1”	375
PVC-SS-MC-2	2”	168

*PN10

Solvent Welding Fitting, PN16 (Continue)

UNION

CODE	SIZE (mm)	QTY/CTN
PVC-SS-UN-20	20	300
PVC-SS-UN-25	25	200
PVC-SS-UN-32	32	120
PVC-SS-UN-40	40	80
PVC-SS-UN-50	50	48
PVC-SS-UN-63	63	54
PVC-SS-UN-75	75	33
PVC-SS-UN-90	90	18
PVC-SS-UN-110	110	12

END CAP PN6

CODE	SIZE (mm)	QTY/CTN
PVC-SS-EC-110	110	115
PVC-SS-EC-160	160	50
PVC-SS-EC-200	200	66
PVC-SS-EC-225	225	36
PVC-SS-EC-250	250	20
PVC-SS-EC-315	315	15

FLANGE ADAPTER & RING

CODE	SIZE (mm)	QTY/CTN
PVC-SS-FG-50	50	48
PVC-SS-FG-63	63	42
PVC-SS-FG-75	75	24
PVC-SS-FG-90	90	45
PVC-SS-FG-110	110	33
PVC-SS-FG-160	160	12
PVC-SS-FG-200	200	6
PVC-SS-FG-225	225	5
PVC-SS-FG-250	250	3
PVC-SS-FG-280	280	3
PVC-SS-FG-315	315*	2
PVC-SS-FG-355	355*	2
PVC-SS-FG-400	400*	2
PVC-SS-FG-450	450*	1
PVC-SS-FG-500	500*	1

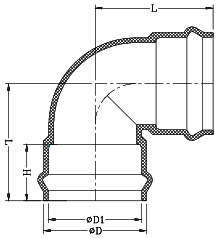
DOUBLE UNION BALL VALVE

CODE	SIZE	QTY/CTN
PVC-SS-DUBV-0.5	20	64
PVC-SS-DUBV-0.75	25	56
PVC-SS-DUBV-1.0	32	36
PVC-SS-DUBV-1.25	40	30
PVC-SS-DUBV-1.5	50	16
PVC-SS-DUBV-2.0	63	8
PVC-SS-DUBV-2.5	75	8
PVC-SS-DUBV-3.0	90	4
PVC-SS-DUBV-4.0	110	2

*PN10

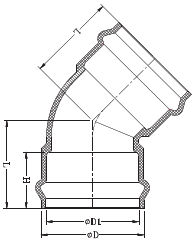
Rubber Ring Fittings to BSEN 1452, PN10

90° ELBOW, PUSH FIT



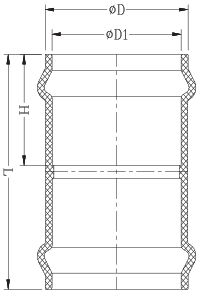
CODE	SIZE (mm)	D	D1	H	L	QTY/ CTN
PVC-RR-E90-110	110	125.70	111.50	122.00	188.50	8
PVC-RR-E90-160	160	181.50	162.30	141.00	236.50	4
PVC-RR-E90-200	200	225.00	202.50	152.00	270.00	2
PVC-RR-E90-225	225	251.50	227.50	139.90	288.00	2
PVC-RR-E90-250	250	276.50	252.30	152.00	312.00	1
PVC-RR-E90-315	315	347.80	318.30	198.00	393.00	1

45° ELBOW, PUSH FIT



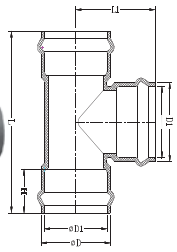
CODE	SIZE (mm)	D	D1	H	L	QTY/ CTN
PVC-RR-E45-110	110	125.70	111.50	122.00	152.00	8
PVC-RR-E45-160	160	181.50	162.30	141.00	183.50	4
PVC-RR-E45-200	200	225.00	202.50	152.00	203.00	3
PVC-RR-E45-225	225	251.50	227.50	139.00	217.00	2
PVC-RR-E45-250	250	276.50	252.30	152.00	236.00	2
PVC-RR-E45-315	315	347.80	318.30	198.00	291.00	1

COUPLER (SOCKET), PUSH FIT



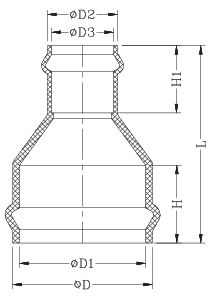
CODE	SIZE (mm)	D	D1	H	L	QTY/ CTN
PVC-RR-CO-90	90	105.50	92.50	95.00	200.00	28
PVC-RR-CO-110	110	125.70	111.50	122.00	280.00	6
PVC-RR-CO-160	160	181.50	162.30	141.00	303.00	4
PVC-RR-CO-200	200	225.00	202.50	152.00	310.00	3
PVC-RR-CO-225	225	251.50	227.50	139.00	362.00	2
PVC-RR-CO-250	250	276.50	252.30	152.00	382.70	2
PVC-RR-CO-315	315	347.80	318.30	198.00	484.00	1
PVC-RR-CO-355	355	388.50	356.63	235.00	384.00	1

EQUAL TEE, PUSH FIT



CODE	SIZE (mm)	D	D1	H	L	L1	QTY/ CTN
PVC-RR-T-110	110	125.70	111.50	122.00	152.00	202.50	6
PVC-RR-T-160	160	181.50	162.30	141.00	183.50	236.50	3
PVC-RR-T-200	200	225.00	202.50	152.00	203.00	270.00	2
PVC-RR-T-225	225	251.50	227.50	139.00	217.00	288.00	1
PVC-RR-T-250	250	276.50	252.30	152.00	236.00	312.00	1
PVC-RR-T-315	315	347.80	318.30	198.00	291.00	393.00	1

REDUCING COUPLER, PUSH FIT



CODE	SIZE (mm)	D	D1	H	D2	D3	H1	L	QTY/ CTN
PVC-RR-RC-160110	160x110	181.50	162.30	141.00	125.70	111.50	122.00	312.00	6
PVC-RR-RC-200160	200x160	225.00	202.50	152.00	181.50	162.30	141.00	300.00	3
PVC-RR-RC-225160	225x160	251.50	227.50	139.00	181.50	162.30	141.00	346.00	2
PVC-RR-RC-225200	225x200	251.00	227.50	139.00	225.00	202.50	152.00	389.25	2
PVC-RR-RC-250200	250x200	276.50	252.30	152.00	225.00	202.50	152.00	389.00	2
PVC-RR-RC-250225	250x225	276.50	252.30	152.00	251.50	227.50	139.00	371.75	2
PVC-RR-RC-315250	315x250	347.80	318.30	198.00	276.50	252.30	152.00	458.00	1
PVC-RR-RC-355315	355x315	388.50	356.63	235.00	347.80	318.30	198.00	476.00	1

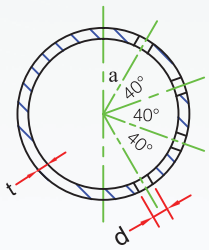
Perforated & Slotted Pipes

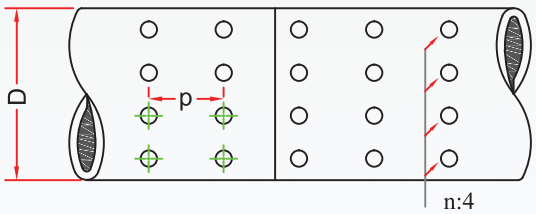
a) Perforated Pipes

Cosmoplast produces wide range of perforated uPVC pipes for Sub-soil drainage applications. The below sketches show the general configurations which may vary depending on size and class of pipe to be perforated.

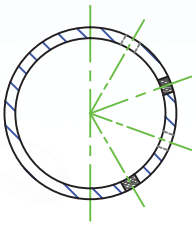
Parameters		Limits of Variation
Outside diameter	D	32mm to 630mm in standard sizes
Wall thickness	t	In accordance with the class of pipes selected
Longitudinal pitch of holes	p	30mm to 200mm depending on size and class of pipe
Hole Diameter	d	3mm to 10mm depending on size and class of pipe
Number of rows	n	1 to 4
Angular pitch of holes	a	40 degrees for 3 or 4 rows 40, 80 or 120 degrees for 2 rows

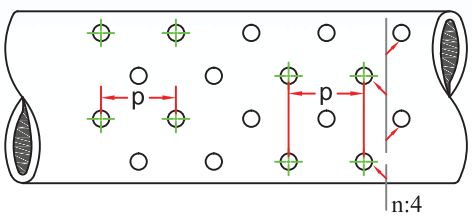
Straight rows





Staggered rows

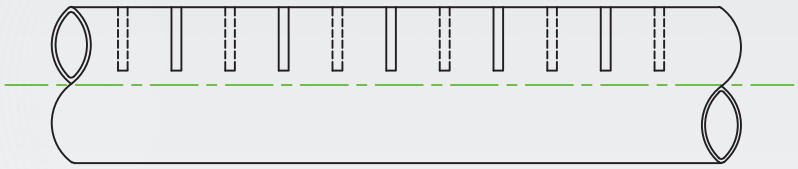


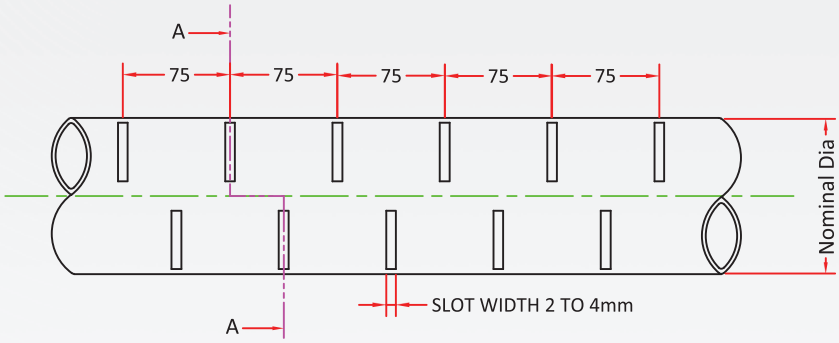


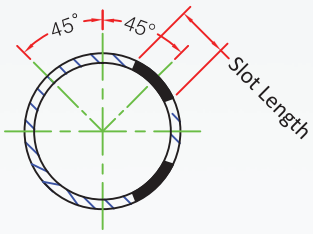
b) Slotted pipes

Cosmoplast produces wide range of SLOTTED uPVC pipes for Sub-soil and Land drain

Cosmoplast uPVC slotted pipes have two rows of circumferential slots which are machine cut and staggered, the slots are cut at an angle of 45° to give a large open area free to carry water. Pipes are slotted to give maximum infiltration as detailed below.







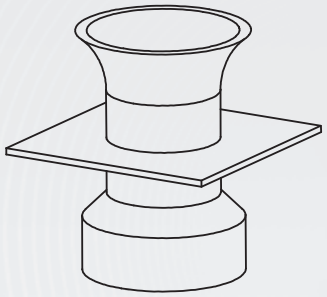
SECTION- AA

SIZES	SLOT LENGTH		SLOT WIDTH		Min.No.of slot per	Min.slot Area	PITCH
mm	Min. mm	Max. mm	Min. mm	Max. mm	MTR/ROW	mm^2/m	mm
110	63	65	2	4	13	4914	75
160	63	65	2	4	13	4914	75
200	76	78	2	4	13	5928	75
225	86	88	2	4	13	6864	75
250	98	100	2	4	13	7644	75
315	120	125	2	4	13	9360	75

Note:
The number of slot, slot width, length, pitch and pattern can be altered to suit specific requirements

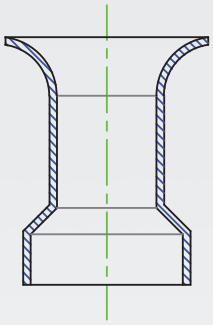
uPVC Bell Mouth Socket

Bell mouth with puddle flange



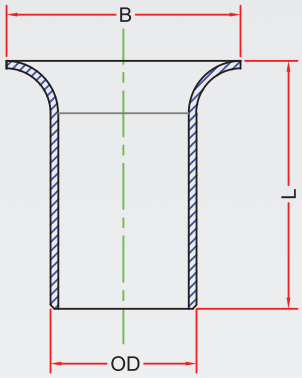
ISOMETRIC VIEW

Socket End Belt Dimension



SECTIONAL VIEW

Spigot End Belt Dimension

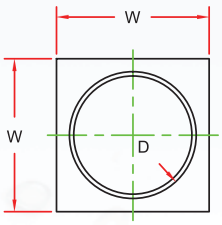


SECTIONAL VIEW

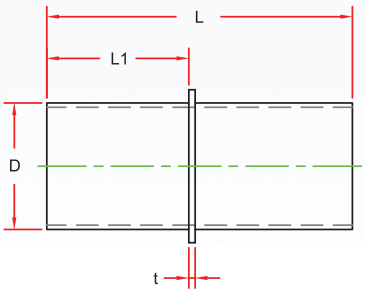
OD (Inch)	OD (mm)	LENGTH (L) (mm)	BELL END (B) (mm)
4	114.1	250	145
6	168.0	250	190
8	218.8	300	265
10	272.6	400	330

Note: The dimensions can be altered to suit specific requirements

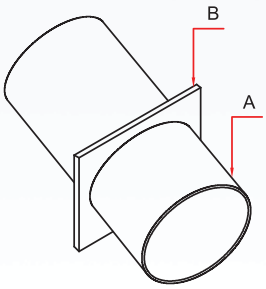
uPV C Puddle Flange

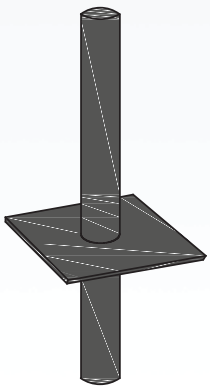


TOP VIEW



FRONT VIEW





ISOMETRIC VIEW

Note: The dimensions can be altered to suit specific requirements

WARRANTY

Cosmoplast uPVC pipes and fittings are subjected to continuous tests during production in order to guarantee high quality and reliability.

Cosmoplast Industrial Co. LLC guarantees that its uPVC Pipes & Fittings are free from manufacturing and material defects.

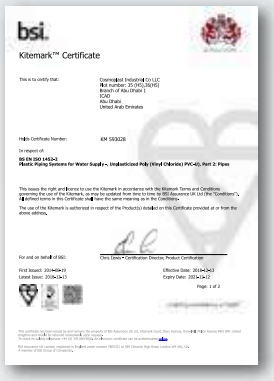
In witness hereof, Cosmoplast issues this warranty for its system of uPVC Pipes and Fittings which shall be valid for a period of ten years starting from the date of installation.

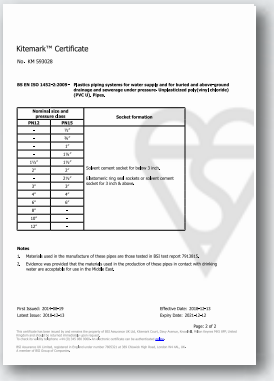
However, Cosmoplast will not accept, and will not be held liable or responsible for damage to these products, or any consequential losses under the following conditions:

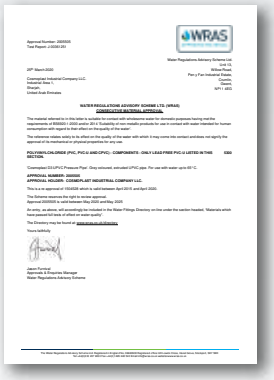
1. If working conditions are different than those prescribed in this catalogues.
2. If the components are used in installations where the fluid is not compatible with the material as per the related international standards.
3. If the components present defects when installed, due to incidental factors easily recognizable at the time of installation or when the system is submitted to pressure test.
4. If Cosmoplast components are installed with other items not manufactured by Cosmoplast.
5. In case of poor or inappropriate storage.

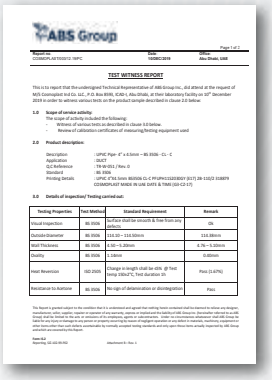
WARRANTY COVERAGE:

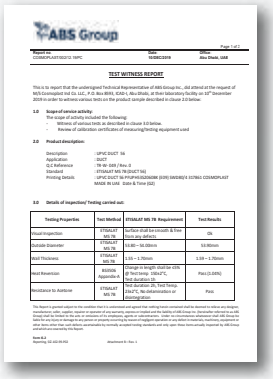
This Warranty is limited only to the replacement of the material with manufacturing defects. Cosmoplast will not be liable for any direct or indirect consequential losses or damages.







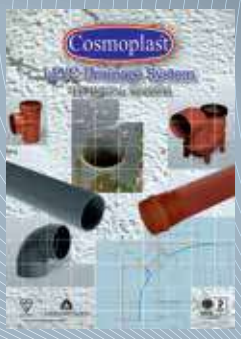


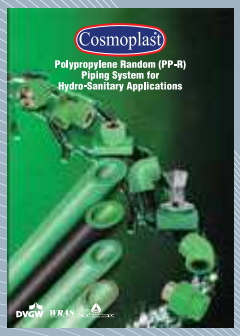


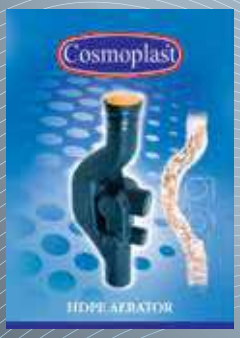
Inline with our product development programme, Cosmoplast reserves the right to modify or change any of the information contained herein without prior notice.

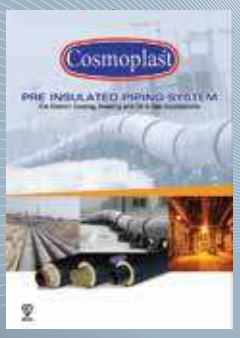
ISO 9001

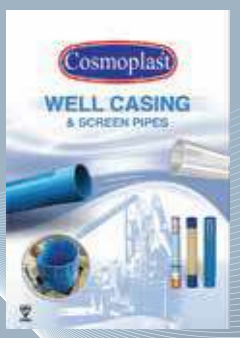
Pipeline Systems

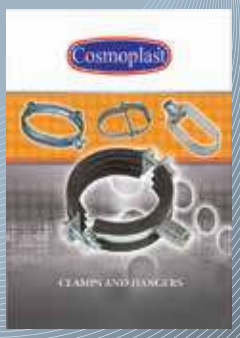


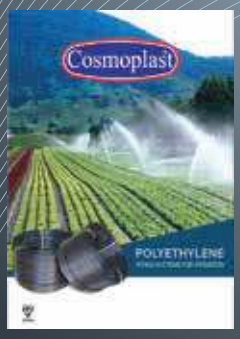


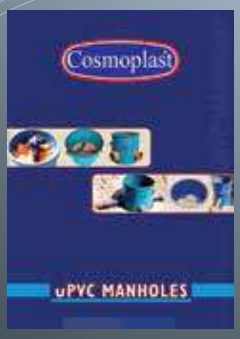


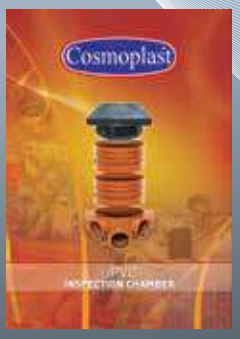












www.cosmoplast.com

Cosmoplast Industrial Co. L.L.C

Sharjah
Sales Off. Tel: +971 6 5331212
Fax: +971 6 5331917 / 5332901
P.O.Box: 6032

Dubai
Tel: +971 4 8850500
Fax: +971 4 8850700
P.O. Box: 50488

Abu Dhabi
Sales Off. Tel: +971 2 5515364
Fax: +971 2 5515365
P .0. Box: 8593

Saudi Arabia-Riyadh
Sales Off. Tel: +966 11 265 4501
Fax: +966 11 471 4669
Email: pipeline@interplast-ksa.com

Qatar-Doha
Tel.: +974 44687881/2
Fax: +974 44687886
Email: info@harwalqa.com

Email: pipeline@cosmoplast.com

Version 5 / October 2021

Group HARWAL
MANUFACTURING TECHNOLOGIES