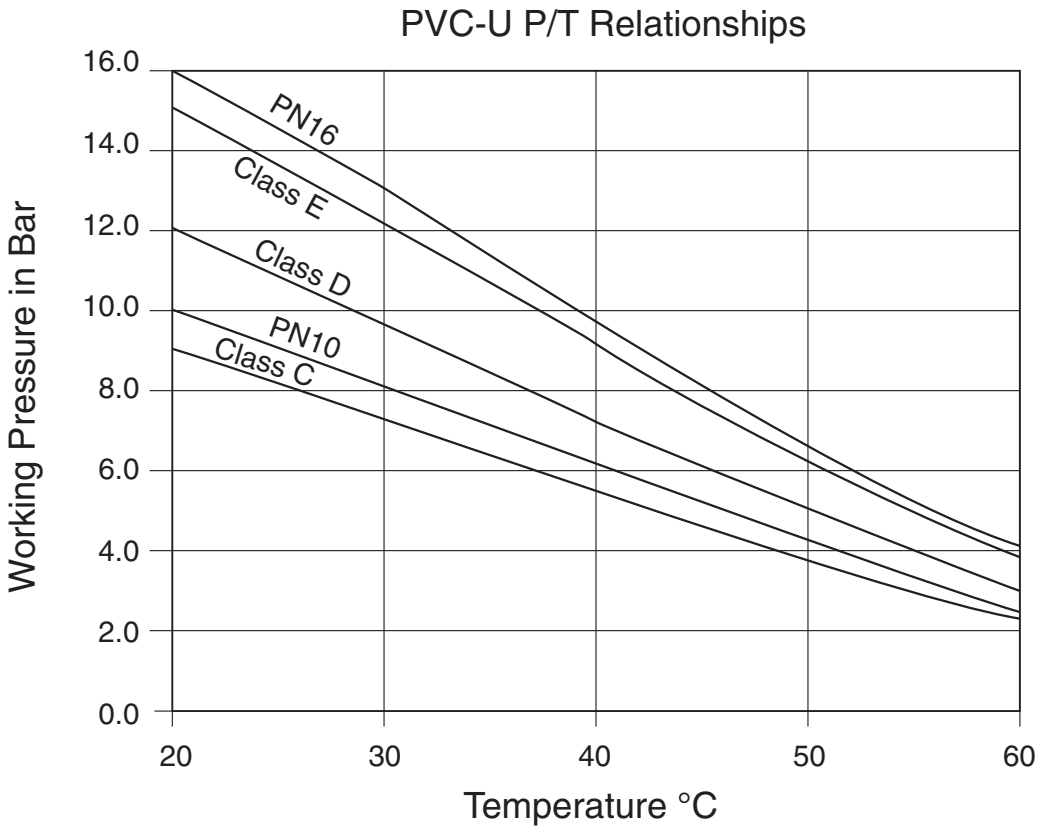
Technical Information

Maximum pressure/temperature relationship

1. Graph is based on an ambient temperature of 20°C.
2. For higher ambient temperatures decrease the working pressure by 5% for every 10°C above 20°C ambient.
3. Durapipe PVC-U systems should not be used at temperatures in excess of +60°C or below 0°C.



Flow calculations

Pressure drop due to friction can be determined for practical purposes using the flow nomogram on the page 10.

The pressure drop at a given flow rate can be determined as follows:

1. Obtain the internal diameter of the pipe to be used by referring to the dimension table right:
2. Mark this diameter on Scale A.
3. Mark the required flow rate in litres per second on Scale B.
4. Draw a straight line connecting the points on Scales A and B and extend this to Scales C and D.
5. The velocity of flow in metres per second is determined from the intersection with Scale C.
6. The frictional head loss in metres per 100 metres of pipe can then be read off Scale D.

Table of Pipe Internal Diameters

Size	Class C	Class D	Class E	Class 7
1/2"	-	-	17.6	13.4
3/4"	-	-	22.3	18.3
1"	-	-	28.6	24
1 1/4"	-	37.2	36.2	31.8
1 1/2"	-	42.7	41.5	37.3
2"	54.7	53.5	51.9	48.5
2 1/2"	-	-	-	-
3"	81.3	78.9	76.5	-
4"	104.5	101.3	98.5	-
5"	-	125.4	-	-
6"	154.1	149.3	144.9	-
8"	203.2	198.2	-	-
10"	253.2	-	-	-
12"	300.2	-	-	-

Note: Dimensions are given for guidance only.

Size	PN10
20	-
25	-
32	28.8
40	36.2
50	45.2
63	57.0
75	67.8
90	81.4
110	101.6
125	115.4
140*	125.4
160	147.6
200	184.6
250	230.8
315	290.8

*=PN12 pipe

Size	PN16
20	17.0
25	21.2
32	27.2
40	34.0
50	45.6
63	53.6
75	63.8
90	76.6
110	96.8
125	-
-	-
-	-
200	-
225	-
315	-

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Fittings

The calculation of pressure drop in fittings is more complex but calculations can be made for equivalent lengths of straight pipe using the Formula E = F x D where:

E = the equivalent pipe length (metres)

F = the fittings constant (see table)

D = the fitting internal diameter in mm.

To calculate the total pressure drop in the system, the equivalent straight pipe lengths for fittings is then added to the total straight pipe length to obtain the total drop.

Fittings constant

90° Elbow	0.03
45° Elbow	0.01
90° Tee – straight through	0.01
90° Tee – side branch	0.06
90° Bend	0.01
45° Bend	0.01
Reducing Bush (per size reduction)	0.015
Butterfly Valves	0.13
Diaphragm Valves	0.23
Check Valves	0.05

These values are included as a guide to facilitate calculation of overall system performance and should not be used in isolation.

Flow nomogram

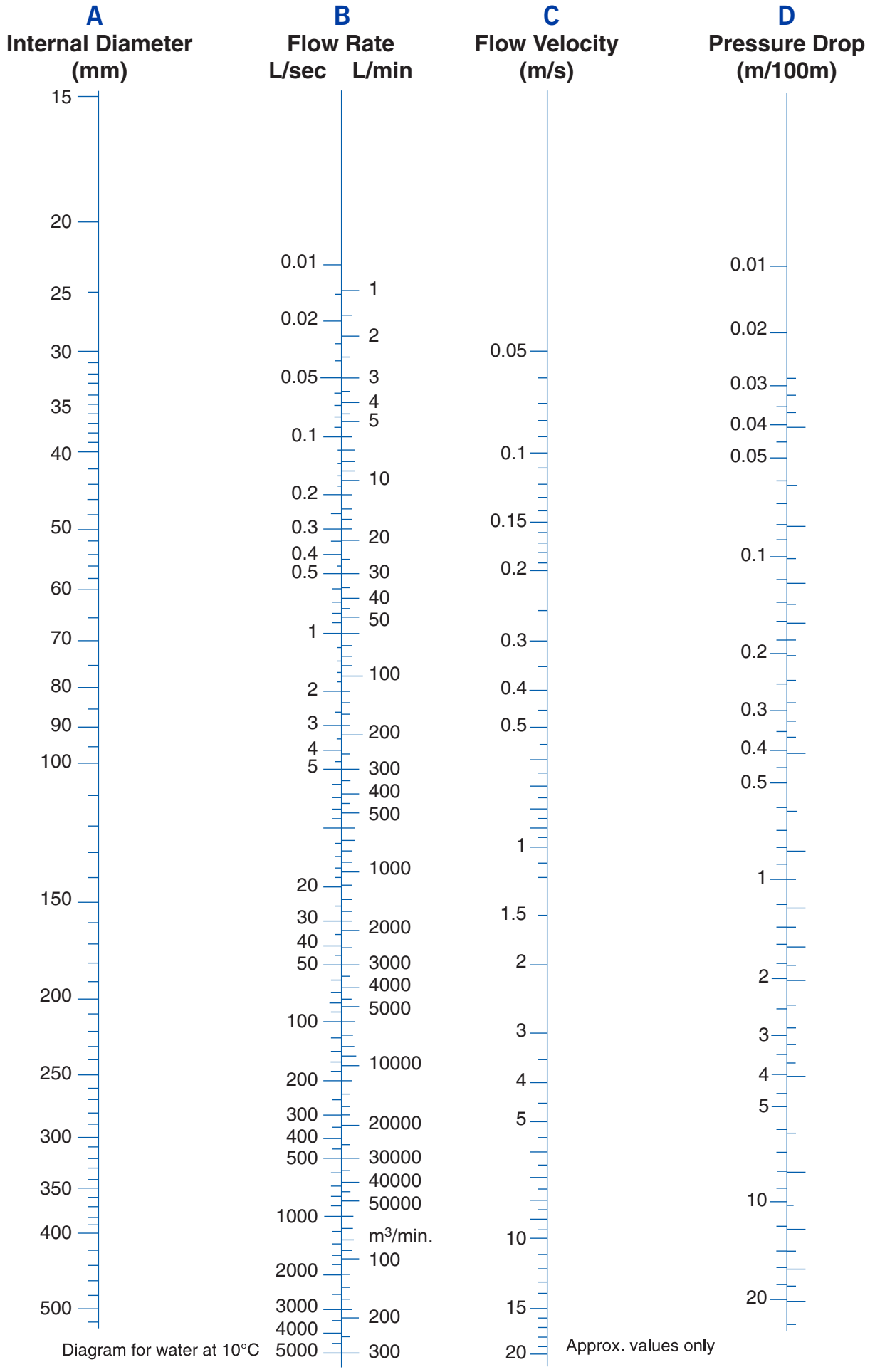


Diagram for water at 10°C

Approx. values only

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Pipe routing

Systems installed above ground should be designed such that there are sufficient changes in direction to accommodate expansion or contraction. The support method described earlier will ensure that the pipework can move axially, without snaking. Utilise all available pipe flexibility. Do not place clips too close to changes in direction.

Calculating expansion and contraction

Temperature variations in a pipework system will increase or decrease the length of each pipe. This is the result of temperature changes in the fluid carried and also from ambient temperature variations.

The rate of expansion or contraction of pipework is dependent on its length, its coefficient of expansion and the temperature difference.

Increase/ decrease in pipe length is given by the formula:

$$\text{Expansion} = L \times \alpha \times \Delta T$$

where: L = length of pipe (mm)
α = coefficient of linear expansion
ΔT = temperature difference of the pipe (°C)

The coefficient of linear expansion for PVC-U = 7×10^{-5}/°C

Rule of thumb: PVC-U expands/contracts 0.7mm/ m per 10°C temperature change:

Example:

What is the expansion/contraction of an insulated, 30m long, PVC-U Condenser water main, installed at 15°C, operating at a maximum temperature of 35°C and a minimum temperature of 5°C?

Expansion:

$L = 30{,}000$ mm
$\alpha = 7 \times 10^{-5}$
$\Delta T = 35 - 15 = 20$°C

Expansion = $30{,}000 \times 7 \times 10^{-5} \times 20$°C
= 42mm

Contraction:

$L = 30{,}000$ mm
$\alpha = 7 \times 10^{-5}$
$\Delta T = 15 - 5 = 10$°C

Contraction = $30{,}000\text{mm} \times 7 \times 10^{-5} \times 10$°C
= 21mm

Hence the system must be designed, using expansion loops, the natural flexibility of pipe, or expansion bellows, to cater for a total differential movement of 63mm with an expansion of 42mm and a contraction of 21mm.

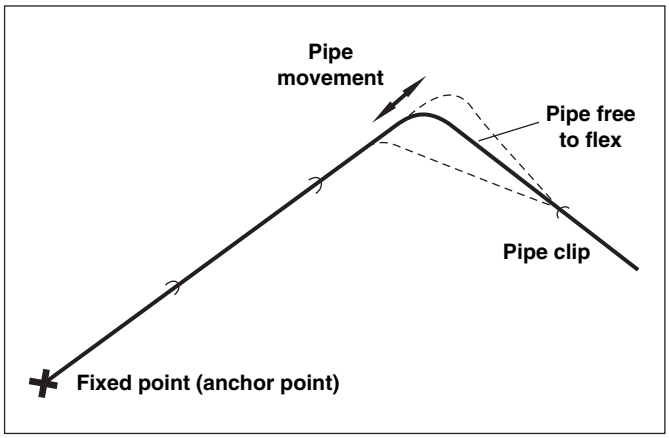
Catering for pipe movement

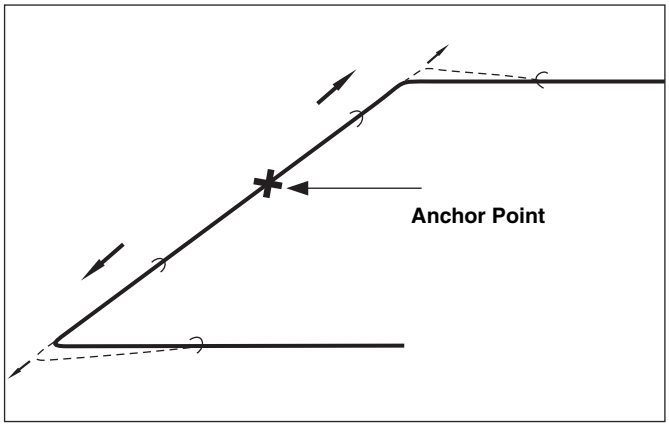
Systems installed above ground should be designed to ensure that there are sufficient changes in direction to accommodate expansion and contraction. The support method described later will ensure that the pipework can move axially without snaking.

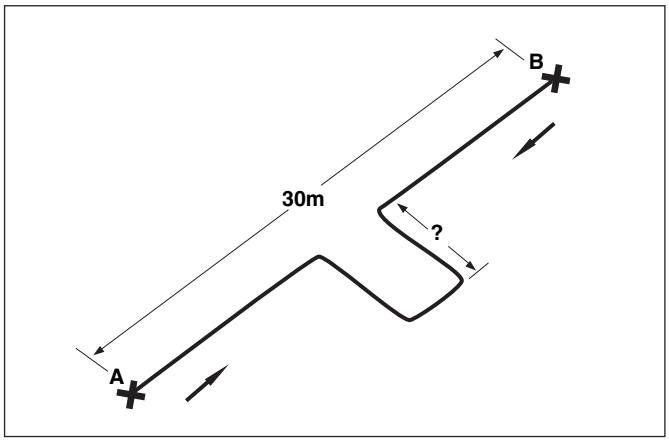
If sufficient changes in direction are not available within the design of the system, alternative methods of catering for pipe movement can be considered such as expansion loops or flexible rubber bellows.

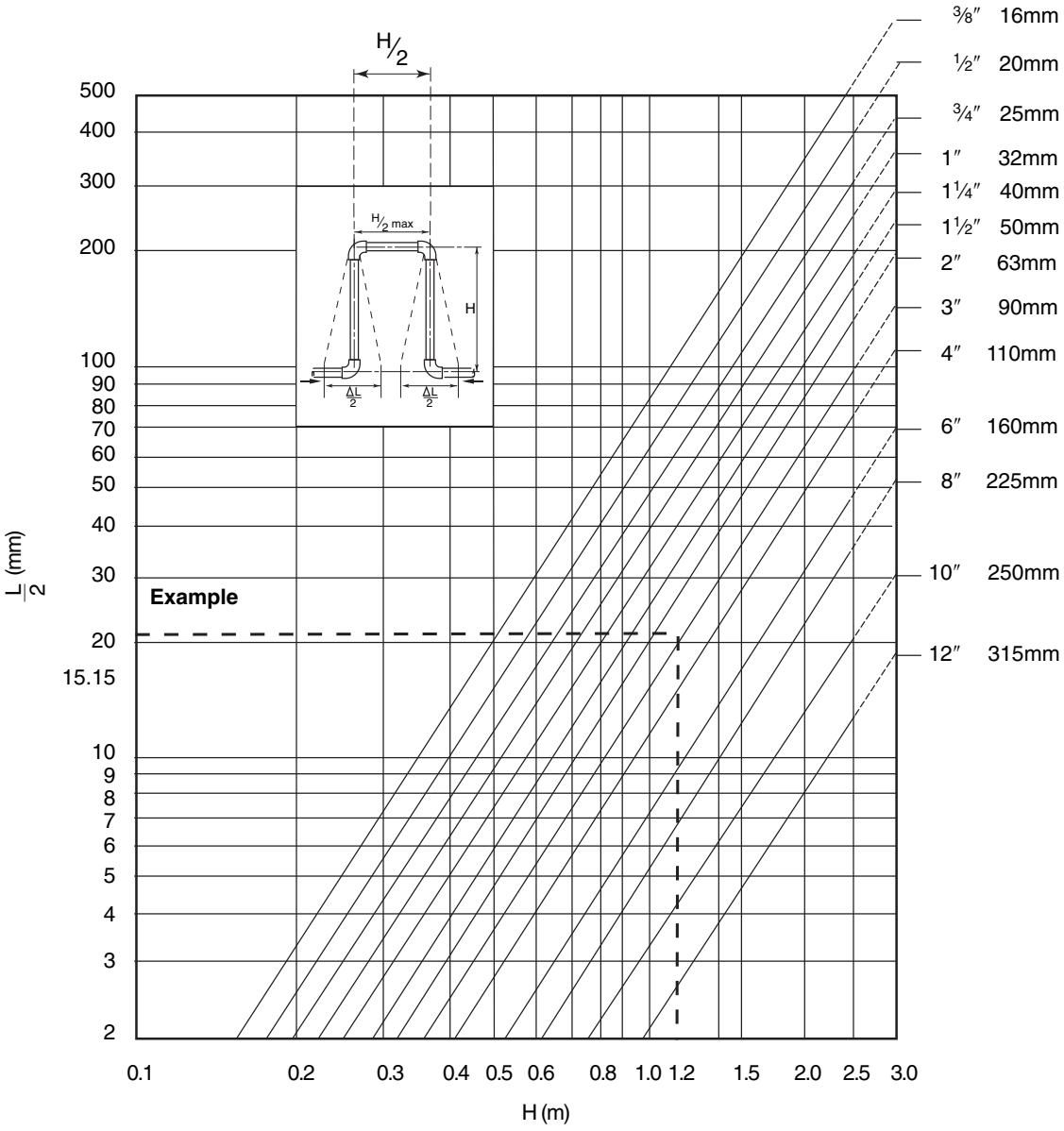
Expansion loops

The length of unrestrained pipe (free leg length) required to accommodate expansion can be calculated from the graph overleaf.









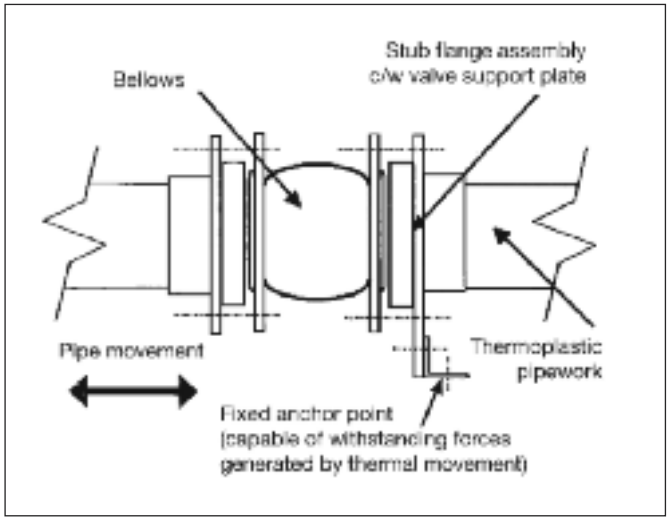
Example:
Calculate the size of expansion loop required for a 90mm diameter pipe expanding 42mm and contracting 21mm:
Based on the worst case ie. 42mm expansion, $\frac{\Delta L}{2} = 21\text{mm}$

Draw a horizontal line from the vertical section to meet the 90mm pipe gradient line.
Drop a perpendicular from the intersection point to the horizontal scale. The figure obtained is the free leg length of the loop required.
Hence, in this instance a loop measuring 1200mm long x 600mm wide will cater for ±21mm movement i.e. the loop will cater for both the expansion and contraction of the pipe.

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Expansion bellows

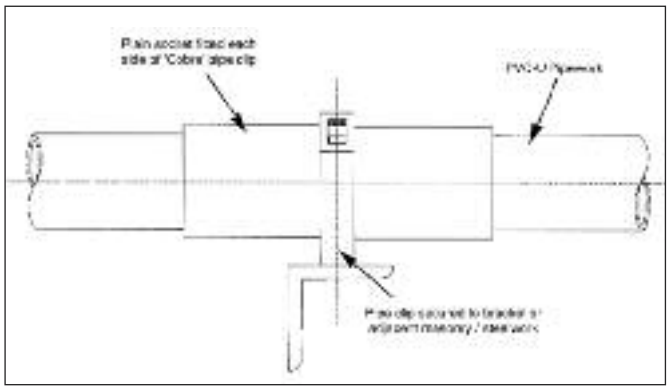
Axial expansion bellows may also be used in place of utilising the natural flexibility of the PVC-U. These must be of a suitable design to ensure correct operation with PVC-U pipework. Contact our Technical Support Department for further information.



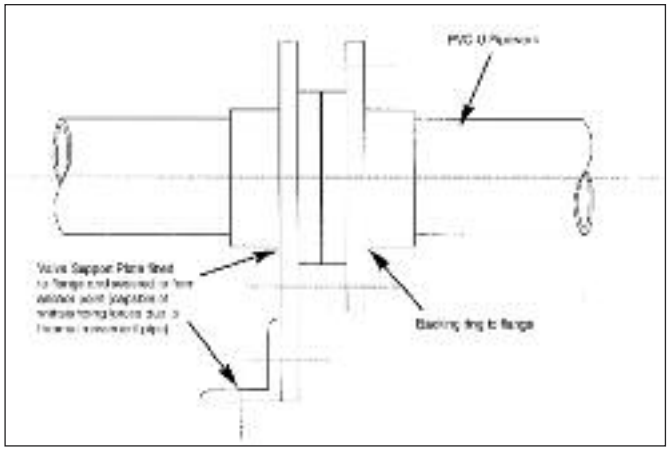
Anchor points

The direction of pipe movement can be controlled by the use of anchor points at strategic positions. There are a number of methods of securely anchoring plastic pipes, some of which are detailed below. However it should be noted that tight fitting pipe supports should not be used since damage to the pipe could occur.

Construction of typical anchor points



1. Small Bore (up to 4" Pipework)



2. Larger pipe (above 4" Pipework)

Pipe supports and clips

Pipe supports and clips should provide lateral restraint and allow free, unrestricted, axial pipe movement. Standard 'drop rods' may not provide sufficient lateral restraint and the PVC-U pipe could start to 'snake'.

Durapipe Cobra clips are designed to meet these requirements. A suitable alternative would be mild steel saddle clips designed with a clearance between the pipe and the clip. All steel brackets in contact with the plastic pipe should be free of sharp edges to avoid damaging the pipe.

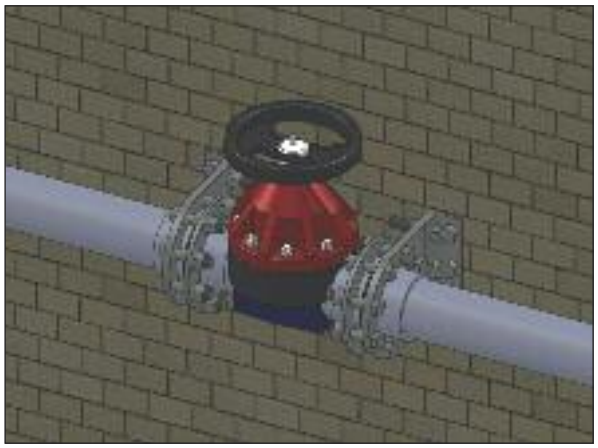
Support centres

The recommended distance between supports for pipes filled with water is given in the table below. Where the contents have a specific gravity greater than 1 the distance must be decreased by dividing the recommended centre distance by the specific gravity. For vertical pipes, support centres may be increased by 50%.

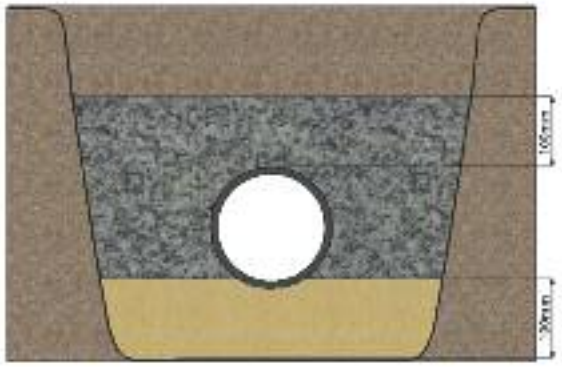
Size mm/imperial	Support Distance (m) at 20°C	Support Distance (m) at 50°C
16mm/3/8"	0.8	0.5
20mm/1/2"	0.9	0.6
25mm/3/4"	1.0	0.7
32mm/1"	1.1	0.8
40mm/1 1/4"	1.2	0.9
50mm/1 1/2"	1.3	1.0
63mm/2"	1.4	1.1
75mm/2 1/2"	1.5	1.2
90mm/3"	1.6	1.3
110mm/4"	1.9	1.3
160mm/6"	2.3	1.6

Support of heavy equipment

Large valves, strainers and other heavy equipment should always be independently supported to prevent undue loading onto the PVC-U system. Durapipe valve support plates have been designed for this purpose and may be used in place of flange backing rings.



Buried pipes



Recommendations covering essential requirements for installations below ground may be summarised as follows:

In general, trenches should not be less than a metre deep.
Trenches should be straight sided, approximately 300mm wider than the pipe diameter to allow proper consolidation of packing materials.
Trench bottoms should be as level as is practical.
Large pieces of rock, debris and sharp objects should be removed.
Alternatively gravel can be laid approximately 100mm deep on the floor of the trench. (Sand may be used but subterranean water is liable to wash sand away and leave the pipe unsupported.)
If pipes are jointed above ground, they should remain undisturbed for 2 hours before being lowered into the trench.
After laying, pipes should be covered with gravel or similar material to a depth of 100mm above the crown of the pipe. The gravel should be extended sideways to both trench walls and compacted. This should be done prior to testing, with joints left exposed.
Care should be taken to ensure that sharp objects, stones, etc, are prevented from falling into the trench before covering the pipe.
After pressure testing, joints should be covered with gravel or similar material, and back filling completed.
A section of pipe installed below ground to the above recommendations is shown in the illustration.

Anchor blocks

For wholly solvent welded systems the pipework is pressure balanced and anchor thrust blocks are not required. When rubber ring joints are used it is necessary to provide concrete anchor blocks of changes in direction such as elbows, bends, tees etc. This is necessary to withstand the forces generated by system pressurisation.
For greater detail, users in the U.K. are recommended to study the Code of Practice CP 312 published by the Pipe and Fittings Group of the British Standards Institute covering installations above and below ground.

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Additional Important Information

Thermal Insulation
Some insulation products can contain substances capable of having a detrimental effect on thermoplastic pipework.

Recommended insulation - A list of some of the common types of insulation materials known to be suitable with PVC-U pipework are as follows;

Fibre wool, such as 'Rockwool'
Armaflex Class 1 HT
Phenolic foam
Polystyrene

Note: the above list is not exclusive – please contact our Technical Support Department on 01543 272446 if further assistance is required.

Certain foam rubbers and adhesives used in conjunction with foam rubber insulation may be detrimental. We do not, therefore, recommend that insulation be bonded to the pipework. Adhesives should only be used to bond adjacent edges together.

Trace heating
Thermoplastic pipework can be damaged by plasticisers used in the outer coverings on some heating tapes. Tapes sheathed in plasticised PVC must be avoided, unless specifically approved by us. (This comment also applies to any tapes, adhesives, or other substances used to secure the heating tape to the pipework.) Recommended heating tapes - The selection of heating tapes with silicone rubber, woven wire, or woven polyester outer sheaths will eliminate the risk of plasticiser migration. These tapes are therefore preferred for use on thermoplastic systems.

Pipe contents identification
Do not put self-adhesive labels directly on to pipe surfaces as this may cause stress cracking. It is recommended that some sort of barrier, such as aluminium foil, is placed between pipe and identification label.

Intumescent mastic and mastic sealants
Certain mastic sealants are formulated with phthalates. Phthalates are known to be extremely aggressive toward PVC-U materials, and therefore confirmation of the suitability of any mastic sealant should be determined before being used in conjunction with PVC-U pipework.

Pipe clips
It is important that the composition of pipe clips and their linings do not include substances which might have a detrimental effect upon the PVC-U pipe. Please check for suitability before use. We recommend the use of Durapipe Cobra clips for pipe sizes up to and including 160mm OD / 6"NB, wherever circumstances allow.

Freezing conditions
Precautions should be taken to prevent contents freezing, as this can cause pipework to split.

Contact with fluxes
Some fluxes can be detrimental to PVC-U. Care should be taken when soldering copper pipework directly above, or close to, PVC-U pipework.

Buried pipes
Do not lay PVC-U in contaminated ground eg. 'brown-field' sites. Do not lay PVC-U in ground where spillages of chemicals may occur.

Thread sealants
Some thread sealants can damage PVC-U. PTFE tape should be used when making threaded connections. See page 19 for further information.

Resistance to UV (sunlight)
Care should be taken to avoid exposure to UV light, eg. sunlight, particularly during storage. This will cause discoloration and deterioration of the PVC-U material. Whilst this is a surface effect only, it is recommended that precautions be taken to prevent this happening. If stored outdoors pipe should be covered with opaque sheeting. If installed outdoors it can be protected from the effects of UV by insulating or painting.

Pressure surges
Durapipe PVC-U pipework can withstand pressure surges within the limitations detailed within CP312 Part 2:1973 and its amendment dated 1977. On no account should pressure surges be allowed to exceed the maximum continuous working pressure calculated using the graph on page 8.

Nominal pressure
Maximum allowed working pressure for continuous use at 20°C in conveying water must be less than or equal to the nominal pressure. If not otherwise stated, nominal pressure of Durapipe FIP fittings is as follow:

Solvent Welded Fittings:
From d12 up to d225 PN16.
From d250 up to d315 PN10.

Adaptor Fittings: From d16 up to d110 PN16.

Threaded Fittings: From 3/8" up to 4" PN16.

WARNING

DO NOT use PVC-U pipework to convey compressed air or gases. Do not test with compressed air or gases. This can result in explosive failure and may cause severe injury.

Approvals and Quality Marks

Durapipe PVC-U pipe and fittings

Durapipe UK offer PVC-U pipework systems comprising pipes, fittings and valves, joined by solvent welding, together with associated accessories. Products are available available in Imperial sizes from 1/2" to 12" (nominal bore) and Metric sizes from 16mm to 315mm (outside diameter).

PVC-U dimensions and standards

Imperial

The Durapipe PVC-U Imperial System is manufactured in accordance with the relevant British Standards as shown below. Kitemark licences are also held, where applicable, for both pipes and fittings BS 5391 (pipe) BS 5392 (fittings).

Metric

The Durapipe PVC-U Metric System is manufactured generally in accordance with the relevant international standards as shown below:
ISO 15493
EN 1452-2

Threaded fittings conform to the requirements of BS 21/DIN 2999/ISO7. Socket dimensions of Durapipe PVC-U Metric fittings for solvent welding comply with ISO/DIS 727-1.

Materials

Durapipe PVC-U material is UK Water Regulations Advisory Scheme approved for cold water services and is listed in the Water Fittings and Materials Directory.

Gaskets and seals

Gaskets and O-Ring seals are made from EPDM except where stated otherwise.

Compatibility

The components of each dimensional system are not interchangeable with each other, except for sizes 75mm/2 1/2" and 140mm/5". They can be joined by using the mm/imperial adaptor fittings or by flanges. They are, however, interchangeable with other piping products manufactured in accordance with the standards referred to.

Approvals and quality marks

- **BSI (British Standard Institution UK) Licence N. KM 05802**

  Durapipe FIP PVC-U Imperial series fittings are covered by Kitemark Licence No. KM 05802 BS 4346-1.

  Durapipe FIP PVC-U solvent cement is covered by Kitemark Licence No. KM6218 to BS 4346: Part 3.

- **WRAS (Water regulations advisory scheme - UK) Certificate N. M103019 / 0402050 / 0201506 and 0201512**

  Durapipe FIP PVC-U Imperial series pipes and fittings are UK Water Regulations Advisory Scheme approved for conveying potable water certificate number M103019 / 0402050

  Durapipe FIP PVC-U materials are also UK Water Regulations Advisory Scheme approved and are listed under 0201506 and 0201512.

  Durapipe FIP PVC-U solvent cement is UK Water Regulations Advisory Scheme approved under 0610503.

- **Regulation 31 approved**

  Approved for use within public water supplies and by the Secretary of State and listed in the 'List of Approved Products' published by the DWI.

- **IIP N. 122 Istituto Italiano dei Plastici (Italian Institute of Plastics)**

  Durapipe FIP PVC-U fittings are manufactured in accordance with UNI EN 1452.

- **ACS France (Attestation de conformité Sanitaire) N. 98 MAT NY 418**

  Durapipe FIP PVC-U is suitable for alimentary applications.

- **NSF (National Sanitation Foundation USA) Certificate N. 11370/11371A**

  Suitability of Durapipe FIP PVC-U for use with drinking water.

- **KIWA (Keurings Institut Voor Waterleiding Artikelen Holland) Certificate N. K5034/01**

  PVC-U fittings according to KIWA BRL K504.

- **IRH**

  Durapipe FIP PVC-U fittings are acknowledged by IRH for ACS Certificate N. 05 MAT NY 006.

- **BUREAU VERITAS (France) Certificate N. 07123 / C0 BV**

  Suitability of Durapipe FIP PVC-U for transporting and treatment of sanitary water for naval applications.

- **Ukrainian hygienic, safety and quality regulation. Certificate N. UA1.094.0052575-04**

  Durapipe FIP PVC-U fittings are certified in compliance with Ukrainian hygienic, safety and quality regulation.

- **RINA – Registro Italiano Navale (Italian Register Naval) Certificate N. MAC/36401/TO/01**

  Suitability of Durapipe FIP PVC-U for transport and treatment of sanitary water and of conditioning for naval applications.

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Reference standards that product is produced to

- **ISO 15493** - Plastics piping systems in PVC-U for industrial applications.
- **BS EN 1452** - Characteristics of PVC-U fittings and pipes of piping systems for water supply.
- **ISO 727** - Pipes and fittings in PVC-U. Dimensions and tolerances metric series.
- **ISO 4422** - Characteristics of PVC-U fittings of piping systems for water supply.
- **DIN 8063** - PVC-U fittings, dimensions.
- **KIWA (Keurings Institut Voor Waterleiding Artikelen Holland) KIWA BRL – K504 e KIWA BRL502** Characteristics of PVC-U fittings and pipes of piping systems for water supply.
- **BSI (British Standard Institution UK) BS 4346-1** - Characteristics of PVC-U fittings of piping systems for fluids under pressure.
- **BS 3505-3506** - Characteristics of PVC-U pipes for industrial fluids and cold water.
- **UNI ISO 228/1:1983** - PVC-U fittings with threaded connections.
- **DIN 2999** - PVC-U fittings with threaded connections.
- **BS 21** - PVC-U fittings with threaded connections.
- **ISO R7:1984** - PVC-U fittings with threaded connections sealing tight.
- **ISO 161/1** - PVC-U pipes and fittings dimensions, metric series.
- **DIN 8062** - PVC-U pipes dimensions.
- **ASTM D696 e DIN 53752** - Coefficient of linear thermal expansion, test and method.
- **DVS 2204-1** - Solvent welding of thermoplastic materials PVC-U.
- **UNI 11242** Solvent welding of PVC-U pipes, fittings and valves.

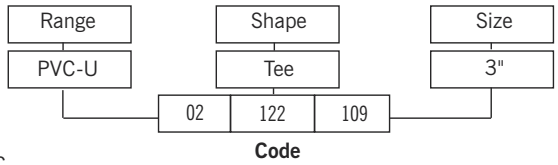
The production of the PVC-U product is in accordance with the highest quality standards and in full observance of the environmental practices imposed by current legislation.

All products are manufactured in accordance with **ISO 9001** certified quality assurance programme. For more information please visit our website **www.durapipe.co.uk**

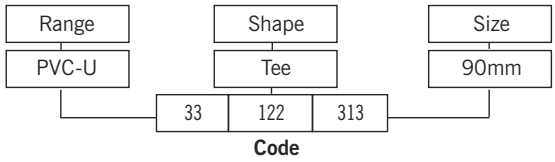
Ordering by code

Code numbers should be used when ordering products eg.

Imperial



Metric



Abbreviations

The following list of abbreviations is used in this catalogue:

ABS	–	Acrylonitrile Butadiene Styrene
ANSI	–	American National Standards Institute
BS	–	British Standards
BSP	–	British Standard Pipe Thread
DIN	–	Deutsche Industrie Normen (German Industrial Standards)
EPDM	–	Ethylene Propylene Rubber
FPM	–	Fluorine Rubber (eg. Viton®)
ISO	–	International Standards Organisation
MEK	–	Methyl Ethyl Ketone
PN	–	Nominal Pressure
PTFE	–	Polytetrafluoroethylene (eg. Teflon®)
PVC-C	–	Corzan, Chlorinated Polyvinyl Chloride
PVC-U	–	Unplasticised Polyvinyl Chloride

® Dupont registered trade name.

Mechanical, Physical and Electrical Data	Value
Mechanical	
Ultimate tensile strength (23°C)	53 MN/m^2
Tensile strength at break	45.00 MPa
Young's Modulus	3060 MPa
Compressive strength	55 MN/m^2
Poisson's Ratio	0.35
Izod impact strength at 23°C (notched)	0.08 kJ/m^2
Physical	
Specific gravity	1.41
Softening point (ISO 306: 1994 method B120)	77°C
Linear coefficient of thermal expansion	7.8 (x10^{-5}/°C)
Heat distortion point	74°C
ASTM D648 – 4.5 MN/m	
Thermal Conductivity	0.147 W/m °C
Specific heat	0.84-2.1 J/g
Electrical	
Dielectric constant	3.0 at 10^{6}Hz
Volume resistivity	10^{16} ohm/cm

Product Specification

IMPERIAL RANGE

DURAPIPE PVC-U PIPES

In accordance with the dimensional and testing requirements of BS EN 1452, Third Party Approved with British Standard Kitemark Licence.

DURAPIPE PVC-U FITTINGS

In accordance with the dimensional and testing requirements of BS 4346 Part 1, Third Party Approved with British Standard Kitemark Licence.

MATCHED SYSTEM

The PVC-U products are designed to ensure complete integrity, quality and compatibility between pipes, fittings and valves. Manufacturers warranties may be compromised if a system is installed with materials from various manufacturers. Where this is not possible then any alternative products should be confirmed as being at least equivalent to that which is normally supplied.

QUALITY SYSTEM

Pipes, fittings and valves shall be manufactured in an environment, which operates a Quality Assurance System assessed to ISO 9001.

ENVIRONMENTAL SYSTEM

The manufacturer of pipes, fittings and valves shall be able to demonstrate compliance with applicable environmental legislation and products shall be manufactured in an environment where documented performance reviews are undertaken and an Environmental Management System is successfully assessed to ISO 14001.

DRINKING WATER/ APPROVAL FOR USE IN CONTACT

Within private property boundaries all PVC-U pipes, fittings and solvent cement shall be listed in the Water Fittings and Materials Directory to show compliance with the requirements of the United Kingdom Water Regulations Advisory Service.

In any situation which could result in the PVC-U pipes, fittings and solvent cement coming into contact with water which is intended for human consumption these shall be in accordance with the requirements of BS 6920 Part 1.

Copies of certification of compliance with these approvals are available for inspection.

Approved for use within public water supplies and by the Secretary of State. Durapipe UK PVC-U is listed in the 'List of Approved Products' published by the DWI.

THIRD PARTY APPROVALS

The manufacturer shall have the following Third Party Approvals:

BRITISH STANDARD KITEMARK LICENCE
KM06218 for solvent cement to BS 4346 Part 3

WRAS WATER REGULATIONS ADVISORY SCHEME
0112065 for Imperial fittings
0610503 for Durapipe solvent cement (5560)

DWI PRODUCT APPROVAL
DWI 56.4.937 Durapipe grey
PVC-U pipe NGS

DESIGN LIFE

Durapipe pipes, fittings and valves are designed to operate continuously for 50 years at their maximum rated pressure at a working temperature of 20°C.

CHEMICAL SUITABILITY

The manufacturer shall publish detailed chemical resistance data to enable the suitability of the PVC-U material, seals, and gaskets to be determined by designers and specifiers.
The manufacturer shall also employ a qualified and experienced Chemist and provide a free-of-charge advisory service for assessing the suitability of its PVC-U material, seals, and gaskets.

INSTALLATION SPECIFICATION

The installation must be carried out by competent persons.
The contractor shall be required to provide technical documentation relating to the manufacturers recommended Installation procedures.
The manufacturer shall publish Installation recommendations, and shall also provide a free-of-charge training service for designers and installers, with appropriate written confirmation of attendance.
Temperature range +5ºC to +60ºC (see page 8 for more details).

DURAPIPE PVC-U BALL VALVES

True union design, end load resistant with full pressure and shock resistant anti blow out device which conforms to design and endurance testing requirements of DIN 3441 Part 1, and DIN 3230 Part 3 Leak Rate One (Water and Air).
Drop Tight and Bubble Tight testing have been satisfactorily completed.
In addition, the following testing has been successfully conducted:
Hydrostatic Shell Test 1.5 x Maximum Working Pressure.
Seat Test 1.1 x Maximum Working Pressure.

PRESSURE RATING
PN16 at 20°C

SEATS AND SEALS
Seats: PTFE material fitted with O-Ring compensators.
Seals: Standard size O-Ring type for ease of replacement, in EPDM or FPM material.

END CONNECTIONS
Plain socket ends, or BSP threaded.

ACTUATION
Options: Electric or pneumatic.

DURAPIPE PVC-U TKD 3-WAY BALL VALVES

True union design. Options of 'L' or 'T' port configuration.
The following testing will have been successfully completed:
Drop Tight and Bubble Tight Test.
Hydrostatic Shell Test 1.5 x maximum recommended pressure.
Seat Test 1.1 x maximum working pressure.

PRESSURE RATING
1/2" to 2" – PN16 at 20°C.

SEATS AND SEALS
Seats: PTFE material fitted with O-Ring compensators.
Seals: Standard size O-Ring type for ease of replacement, in EPDM or FPM material.

END CONNECTIONS
Plain socket ends or BSP threaded.

DURAPIPE PVC-U DIAPHRAGM VALVES

Will be equipped with a maintenance free hand wheel actuator with spindle extension to indicate the position of the valve open or closed.
The body retaining bolts will be fixed from the underside, to provide a crevice free outer surface to prevent accumulation of debris or risk of corrosion of exposed steel bolts from chemical spillage.
Valves will have been hydrostatically pressure tested to the requirements BS 4346 Part 1, BS 5156, ISO 7508 and DIN 3230 Part 3 Leak Rate One

PRESSURE RATING
1/2" to 4" – PN10 at 20°C

DIAPHRAGM TYPE
Choice of EPDM, FPM or PTFE will be available.

END CONNECTION
These may be plain spigot ends or flanged.

ACTUATION
Options – Pneumatic

DURAPIPE PVC-U BALL CHECK VALVES

These shall be double union with plain socket or BSP threaded end.

PRESSURE RATING
1/2" to 2" – PN16 at 20°C.

SEALS
Seals: Will be EPDM or FPM material.

DURAPIPE BUTTERFLY VALVES

Reinforced Polypropylene body, fully lined, with PVC disc.

Full flanged design, with oval holes/inserts to suit various standard flange drillings.

Lever operated, with 10 x 10° position stops, and locking device.

PRESSURE RATING
1 1/2" to 10" – PN10 at 20°C
12" – PN8 at 20°C

PRIMARY LINER
Available in EPDM, FPM, or NBR

ACTUATION
Electric, Pneumatic, or Gearbox (standard on sizes over 8")

Tel: +44 (0)1543 279909 Fax: +44 (0)1543 279450

METRIC RANGE

DURAPIPE PVC-U PIPES

In accordance with the requirements of EN 1452-2, DIN 8061/2, and ISO DIS 15493. Pressure rating PN 16.

DURAPIPE PVC-U FITTINGS

In accordance with the requirements of EN 1452-3, DIN 8063, ISO 727 and ISO DIS 15493. Pressure rating PN 16 up to size 160mm, and PN 10 in larger sizes.

MATCHED SYSTEM

Durapipe PVC-U products are designed to ensure complete integrity, quality and compatibility between pipes, fittings and valves. Warranties are compromised if a system is installed with materials from various manufacturers. Where this is not possible then any alternative products should be confirmed as being at least equivalent to that which is normally supplied.

QUALITY SYSTEM

Pipes, fittings and valves shall be manufactured in an environment which operates a Quality Assurance System assessed to ISO 9001.

ENVIRONMENTAL SYSTEM

The manufacturer of pipes, fittings, and valves shall be able to demonstrate compliance with applicable environmental legislation and products shall be manufactured in an environment where documented performance reviews are undertaken and an Environmental Management System is successfully assessed to ISO 14001.

APPROVAL FOR USE IN CONTACT WITH DRINKING WATER

Within private property boundaries all PVC-U pipes, fittings and solvent cement shall be listed in the Water Fittings and Materials Directory to show compliance with the requirements of the United Kingdom Water Regulations Advisory Service.

In any situation which could result in the PVC-U pipes, fittings and solvent cement coming into contact with water which is intended for human consumption these shall be in accordance with the requirements of BS 6920 Part 1.

Copies of certification of compliance with these approvals are available for inspection.

Approved for use within public water supplies and by the Secretary of State. Durapipe UK PVC-U is listed in the 'List of Approved Products' published by the DWI.

THIRD PARTY APPROVALS

The manufacturer shall have the following Third Party Approvals:

WRAS WATER REGULATIONS ADVISORY SCHEME

0402050 for Metric size pipe and fittings
0610503 for Durapipe solvent cement (5560)

DWI PRODUCT APPROVAL
DWI 56.4.937 Durapipe grey
PVC-U pipe NGS

DESIGN LIFE

Durapipe pipes, fittings and valves are designed to operate continuously for 50 years at their maximum rated pressure at a working temperature of 20°C.

CHEMICAL SUITABILITY

The manufacturer shall publish detailed chemical resistance data to enable the suitability of the PVC-U material, seals, and gaskets to be determined by designers and specifiers.

The manufacturer shall also employ a qualified and experienced Chemist and provide a free-of-charge advisory service for assessing the suitability of its PVC-U material, seals, and gaskets.

INSTALLATION SPECIFICATION

The installation must be carried out by competent persons.

The contractor shall be required to provide technical documentation relating to the manufacturers recommended Installation procedures.

The manufacturer shall publish Installation recommendations, and shall also provide a free-of-charge training service for designers and installers, with appropriate written confirmation of attendance.
Temperature range +5ºC to +60ºC (see page 8 for more details).

DURAPIPE PVC-U BALL VALVES

True union design, end load resistant with full pressure and shock resistant anti blow out device which conforms to design and endurance testing requirements of DIN 3441 Part 1, and DIN 3230 Part 3 Leak Rate One (Water and Air).

Drop Tight and Bubble Tight testing have been satisfactorily completed.
In addition, the following testing has been successfully conducted:
Hydrostatic Shell Test 1.5 x Maximum Working Pressure.
Seat Test 1.1 x Maximum Working Pressure.

PRESSURE RATING
PN16 at 20°C

SEATS AND SEALS
Seats: PTFE material fitted with O-Ring compensators.
Seals: Standard size O-Ring type for ease of replacement, in EPDM or FPM material.

END CONNECTIONS
Plain socket ends, BSP threaded or flanged.

ACTUATION
Options: Electric or Pneumatic.

DURAPIPE PVC-U TKD 3-WAY BALL VALVES

True union design. Options of 'L' or 'T' port configuration.
The following testing will have been successfully completed:
Drop Tight and Bubble Tight Test.
Hydrostatic Shell Test 1.5 x maximum recommended pressure.
Seat Test 1.1 x maximum working pressure.

PRESSURE RATING
16mm to 63mm – PN16 at 20°C.

SEATS AND SEALS
Seats: PTFE material fitted with O-Ring compensators.
Seals: Standard size O-Ring type in EPDM or FPM material.

END CONNECTIONS
Plain socket ends or BSP threaded.

DURAPIPE PVC-U DIAPHRAGM VALVES

These are equipped with a maintenance free hand wheel actuator with spindle extension to indicate the position of the valve open or closed.
The body retaining bolts are fixed from the underside to provide a crevice free outer surface to prevent accumulation of debris or risk of corrosion of exposed steel bolts from chemical spillage.
Valves have been hydrostatically pressure tested to the requirements of DIN 8063, ISO 5208, ISO 7508 and DIN 3230 Part 3 Leak Rate One.

PRESSURE RATING
20mm to 110mm – PN10 at 20°C

DIAPHRAGM TYPE
Choice of EPDM, FPM or PTFE will be available.

END CONNECTION
These may be plain spigot ends or flanged.

ACTUATION
Options: Pneumatic

DURAPIPE PVC-U BALL CHECK VALVES

These shall be double union with plain socket or BSP threaded end.

PRESSURE RATING
20mm to 63mm – PN16 at 20°C.

SEALS
Seals: Will be EPDM or FPM material.

DURAPIPE BUTTERFLY VALVES

Reinforced Polypropylene body, fully lined, with PVC disc.

Full flanged design, with oval holes/inserts to suit various standard flange drillings.

Lever operated, with 10 x 10° position stops, and locking device

PRESSURE RATING
50 mm to 250mm – PN 10 at 20°C
315 mm – PN 8 at 20 °C

PRIMARY LINER
Available in EPDM, FPM, or NBR

ACTUATION
Electric, Pneumatic, or Gearbox (standard on sizes over 225 mm).