

EASY-LAY PB BARRIER PIPE

Easy-Lay PB the flexible Grey/White coloured polybutylene plumbing pipe.

Easy-Lay PB has been developed, tested and approved for hot and cold water services, central and underfloor heating systems.

Easy-Lay PB is designed to suit BS 7291 Pushfit and standard Brass Compression Fittings and Manifolds.

Easy-Lay PB is available in the following sizes in both lengths & coils.

Metric Sizes:- 10mm, 15mm, 22mm, and 28mm

Easy-Lay PB is available with an EVOH Barrier which complies with DIN 17455 / DIN4726

Easy-Lay PB is rigid enough to minimise sag with pipe runs looking neat, tidy and professional.

Easy-Lay PB is flexible enough to be cabled through awkwardly placed holes under flooring and threaded behind partition walls and through ducts.

Easy-Lay PB enables the installer to undertake faster, easier and more cost-effective installation. Independent tests show installation time savings of up to 40% compared with traditional plumbing materials.

Easy-Lay PB metric size pipe is BSI Kitemark approved for use under service conditions Class S listed in BS 7291: Parts 1 and 2.

12 Bar at 20°C - 7 Bar at 82°C and short term overload temperatures up to 114°C.

Easy-Lay PB is also approved for use by:- WRAS (Water Regulations Advisory Scheme).

Easy-Lay PB incorporates an EVOH oxygen diffusion barrier layer sandwiched within the wall of the pipe, which protects the layer from physical and UV damage. The EVOH layer renders the pipe virtually impervious to gases.

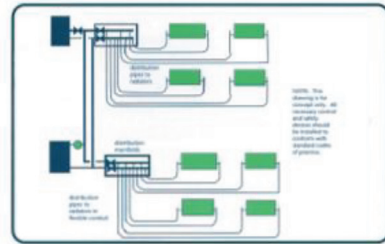
Easy-Lay PB barrier pipe improves the performance of sealed central heating systems by reducing the risk of pressure drops

caused by a vaporisation of water and corrosion which can occur in a boilers heat exchanger.

DISTRIBUTION MANIFOLDS

A centrally located, easily accessible manifold acts as the control centre for the heating / plumbing system. Each appliance has its own unbroken supply line to/from the manifold eliminating the need for any inaccessible joints under floors, behind walls etc.

Easy-Lay PB pipe is perfect for this application with the right degree of flexibility to bend around corners without using fittings. As each appliance has its own dedicated supply/return line the pipe runs can be made with smaller bore and even more flexible Easy-Lay PB pipe.



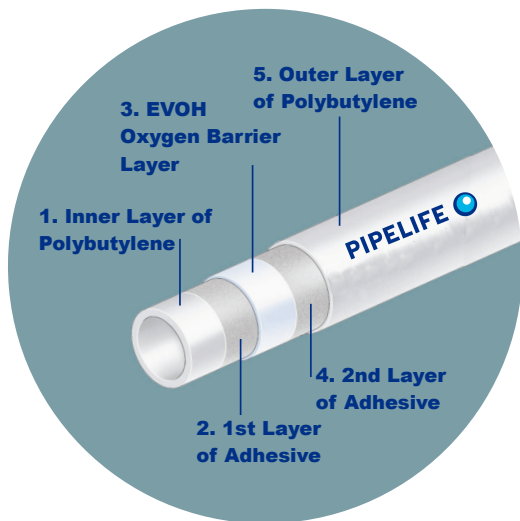
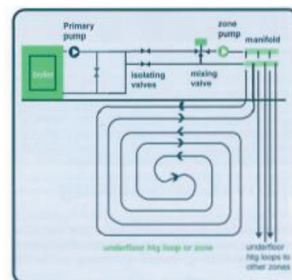
UNDERFLOOR HEATING SYSTEMS.

Underfloor Heating Systems already heat 75% of all family dwellings in continental Europe. Now it is gaining in popularity and credibility in Western Europe, particularly in purpose built new homes. It is one of the most comfortable, efficient (approx. 12% energy savings) and healthy ways to heat a house. Also, with no radiators, you can achieve increased wall and floor space.

Pipelife Underfloor Heating (UFH) System is one where Easy-Lay PB coils are laid in the concrete floor or under suspended timber floors and warm water is circulated through these loops. The gentle heat generated rises uniformly through the room. The floor surface temperature does not exceed a comfortable 29°C, in contrast to radiators which reach 80°C. Most floor coverings can be used with UFH. Gas/Oil Boilers or Heat Pumps may be used with this system. The loops of Easy-Lay PB start at a valved supply manifold and can be individually controlled manually or thermostatically using thermoelectric actuators.

The Easy-Lay PB loops then run under the floor before terminating at a return manifold, which is located under the supply manifold, in a central position in the building. Pipelife offer a design and support service to Plumbing Contractors through authorised stockists of Easy-Lay PB nationwide.

Once you send in the plans of the house, our Engineer designs the system. By using a custom made software package, our engineers can design a full or partial underfloor heating system, customised for any building type.



EASY-LAY PB APPLICATION GUIDELINES

PRODUCT SELECTION AND INSTALLATION

Pipelife UK Limited pipe and related products are specifically designed and manufactured by Pipelife UK Limited to the Technical Specifications set out in the Pipelife Limited Product Catalogues and on our website (www.pipelife.co.uk).

It is the customer's / user's responsibility to ensure that Pipelife UK Limited pipe and related products are suitable for their intended applications, are properly installed and maintained and are used in accordance with the Technical Specifications. It is also the customer's / user's responsibility to provide it's own customers with any relevant technical information about Pipelife UK Limited products it supplies them.

Easy-Lay PB is suitable for use in hot and cold water distribution systems, underfloor heating systems and central heating systems that are operated continuously at temperatures up to 92°C at 3 bar pressure. Short-term overload temperatures up to 114°C are permissible. For cold water systems Easy-Lay PB is suitable for use up to 12 bar pressure. For hot water systems Easy-Lay PB is suitable for use up to 7 bar pressure.

Easy-Lay PB can be joined using any standard BS 864 compression fitting or BS 7291 approved push-fit fitting designed for use with 10mm, 15mm, 22mm and 28mm pipe.

Easy-Lay PB is a extremely flexible pipe that can be used as a direct replacement for copper in many applications.

Easy-Lay PB's External toughness and flexibility at low temperatures allows the pipe to be used with little risk of bursting where frost damage might otherwise occur.

Specification

Material

Easy-Lay PB is a Polybutylene Pipe

Dimensions	10mm	15mm	22mm	28mm
Outside diameter (mm)	10 ±0.1	15±0.1	22±0.1	28±0.1
Wall thickness (mm)	1.5-1.8	1.5-1.8	2.00-2.30	2.60-2.90
Weight /100 (meters)	4.14kg	6.9kg	12.9kg	20.4kg
Standard lengths		3m&6m	3m&6m	3m&6m
Standard coils (meters)	50/100	25/50/100	25/50/100	25/50

Mechanical Properties of Easy-Lay PB:

Tensile Strength (at break): mm/min.	20Mpa
Elongation at break (minimum):	125%
Co-efficient of linear expansion (20°C)	1.5 x 10-4m/°C
Co-efficient of linear expansion (82°C)	2.8 x 10-4m/°C

Approvals and Testing

Easy-Lay PB has been tested according to the British Standard BS 7291, which are the most stringent European standards for central-heating, underfloor heating and hot/cold water systems.

- Easy-Lay PB is WRAS (Water Regulations Advisory Scheme) approved.
- Easy-Lay PB (metric size) is BSI kitemark approved to BS7291 Class S Part 1 & 2: 2010.

Quality Control Testing

Easy-Lay PB is manufactured in an ISO 9001 Quality Management System approved facility. Easy-Lay PB pipe is sampled frequently during normal production and subjected to rigorous tests to establish that it meets specifications for mechanical strength at elevated temperatures and pressures, as specified in BS7291 – 1 & 2 : 2010.

Easy-Lay PB Installation Guidelines

Cutting

To ensure successful jointing, pipe ends should be cut smoothly and squarely with purpose-made pipe cutters.

Jointing

All cut ends of Easy-Lay PB require internal support inserts to be fitted before insertion into a fitting. This insert is designed by Pipelife within very fine tolerances to give a perfect fit and to have very high strength.

Bending

For sharp bends standard elbow fittings should be used. Where slower 90° bends are required in 15mm Easy-Lay PB it is often quicker, neater and cheaper to use a standard 15mm x 90° angle bracket/cold forming bend.

Gentle bends may be made by the use of pipe clips on either side of the bend, positioned to maintain the bend radius.

The use of bending springs and skilled manipulation is not required. The pipe should not be heated with a blow-lamp or hot-air gun.

Minimum bend radi are as follows:

10mm Easy-Lay PB	45 mm using pipe clips
15mm Easy-Lay PB	100 mm using pipe clips
22mm Easy-Lay PB	175 mm using pipe clips
28mm Easy-Lay PB	300 mm using pipe clips

Expansion and Contraction

Compared with steel or copper, Easy-Lay PB has a high coefficient of expansion and precautions should be taken to compensate for this. The coefficient of expansion for Easy-Lay PB increases from about $1.5 \times 10^{-4} \text{m}^{\circ}\text{C}$ at 20°C to approximately $2.8 \times 10^{-4} \text{m}^{\circ}\text{C}$ at 82°C.

N.B. Allow for 1% expansion on the length when pipe is installed at 20°C for use up to 82°C.

Where Oual-PB is to be surface mounted and used in visible situations for either hot-water supply or central-heating pipework, long straight runs should be avoided since some distortion may occur. Where this is not practicable, pipework should be boxed.

Care should be taken at all times to ensure that pipework is laid out to allow for expansion and contraction. Where appropriate, expansion loops may be employed.

Clipping

Pipe clips and trunking systems designed for use with copper tube may also be used with Easy-Lay PB. Clips should be positioned adjacent to fittings wherever possible, making due allowance for expansion and contraction of the pipework. Where Easy-Lay PB is to be surface mounted and visible, the following clipping distances are recommended:

10mm, 15mm Easy-Lay PB	20°C	60°C	80°C
- Horizontal	500mm	400mm	300mm
- Vertical	800mm	600mm	500mm
22mm Easy-Lay PB			
- Horizontal	800mm	600mm	500mm
- Vertical	1200mm	1000mm	800mm
28mm Easy-Lay PB			
- Horizontal	800mm	600mm	500mm
- Vertical	1200mm	1000mm	800mm

Where Easy-Lay PB is to be boxed in or installed under floors or in loft spaces etc, clipping distances can be increased, or the clips omitted altogether if the pipe is adequately supported by other means. Even if Easy-Lay PB dips slightly between the joints, the speed of water created by the pump is sufficient to move any bubbles of air that may be present in the system. Pump speeds of 1 .5m/s may be used with Easy-Lay PB without causing undue noise.

Ducting and Insulation

Easy-Lay PB is a tough material that needs no greater protection from accidental damage when installed than copper. As with copper, Easy-Lay PB pipe should be sleeved when passing through walls and protected from nails etc, when placed under floorboards or buried under plaster. Note that some local authorities advise that all pipework in screeded floors should be run in ducting to facilitate easy extraction in case of accidental damage e.g. puncturing with a nail.

Under intermediate floors lagging is not required on Easy-Lay PB pipe, but insulation should be used where Easy-Lay PB is run in unheated spaces, for frost protection and energy conservation. It should be noted that heat losses from Easy-Lay PB are less than those of rigid pipes, and Easy-Lay PB is resistant to bursting, down to -20°C. Although concrete has no adverse effect on Easy-Lay PB, and it may be buried directly in concrete (subject to bye-laws), in order to avoid heat losses it is advisable to thermally insulate the pipe in ground floors.

Surface temperatures

Due to its low thermal conductivity, Oual-PB has a much lower surface temperature than copper pipe. As a guide, the following formula can be used to estimate surface temperatures:

$$\text{Surface temperature } T^{\circ}\text{C} = 0.75 \times (T_i - T_a) + T_a$$

Where T_i = flow temperature in the pipe ($^{\circ}\text{C}$).

T_a = ambient temperature ($^{\circ}\text{C}$)

Boiler and Cylinder Connections General Requirements

Care should be taken to ensure that all boiler installations have the necessary control and safety devices to ensure that the operating conditions laid down in BS 7291: Parts 1 & 2 are not exceeded. The heating system must be installed to meet the requirements of BS 5955. The boiler shall be commissioned in accordance with manufacturer's instructions and the relevant standards BS 6798 and BS 8303.

All pipework between the boiler and the safety valve should be installed using copper tube. Where zone controls or thermostatic radiator valves which may cause a reduction in water flow rates through the boiler are installed, a permanent by-pass should be installed between the main flow and return pipework. Installers should ensure that the system is properly filled and vented during the commissioning stage before the boiler is operated.

Note: Pipelife recommends that the balancing valve for the hot water circuit be a brass lockshield gate valve (conforming to BSS 154/B).

Specific Requirements

Low water content boilers with cast iron heat exchangers.

A minimum of 1 metre of copper tube is required between the boiler connections and Easy-Lay PB. Furthermore a permanent by-pass must be fitted directly after the pump between the main flow and return pipes to allow the pump to dissipate residual heat from the boiler under all circumstances.

Lightweight system boilers with copper heat exchangers.

Easy-Lay PB may be connected directly to the boiler connections provided that (a) the boiler incorporates a high limit stat, (b) the connections are outside the casing, and (c) these connections are more than 350mm from the heat exchanger. Note that all three requirements must be met.

All Heat Emitting Appliances.

A minimum of 1 metre of copper tube is required between the appliance connections and Easy-Lay PB. All appliances should incorporate a high limit stat to protect pipework in the event of boiler malfunction.

Solid Fuel Boilers

The gravity circuit on a solid fuel heating system should always be installed using copper tube. Easy-Lay PB may be used on the secondary (pumped) side of a solid fuel heating system, provided that the nearest connection to the boiler is at least one metre away from the boiler and outside the fireplace.

Pressure Testing

Pressure test the system for at least 1 hour using the conditions for pressure testing listed in BS 5955.

1. For sections of the system, which can be subjected to full mains pressure, apply a minimum test pressure of the available mains water pressure.
2. For sections of the system downstream of a pressure control valve, apply a test pressure equal to the pressure control valve setting.
3. For heating systems apply a test pressure equal to the pressure relief valve setting.

Gas pipe

Easy-Lay PB should NEVER be used to carry gas.

Electrical connections

Since it is extruded from a plastic material, Easy-Lay PB is an insulator and is not suitable for earthing electrical appliances.

Guidelines for Earthing Plastic Pipe

Supplementary bonding is not required to metal parts supplied by plastic pipes such as metal hot and cold water taps supplied from plastic pipes. A metal bath not connected to extraneous-conductive-parts (such as structural steelwork) with plastic hot and cold water pipes and plastic waste pipes does not require supplementary bonding. Supplementary bonding in a bathroom or shower room

will still be required between simultaneously accessible exposed-conductive-parts of equipment such as between metal appliances e.g. heaters, showers and accessible luminaires.

CIRCULATING MAIN INSTALLATIONS

A continuously operated re-circulating system is a water replenished circulating system which is maintained at a constant high temperature to provide a constant source of hot water. Continuously operated re-circulating systems are used to distribute constant hot water to draw off points that may be distant from the source or hot water storage vessel. Continuously operated recirculating systems are very different from conventional hot water supply and central heating systems found in domestic properties, for which our products have been tested to, under BS7291 Class S approval standard, and for this reason Easy-Lay PB products must not be used on any continuously operated re-circulating systems as they are not approved under the current version of this standards.

Handling and Storage

To maintain Easy-Lay PB pipe in the best possible condition for use it may be stored either horizontally or vertically but should be out of direct sunlight. Easy-Lay PB is stabilised to withstand limited exposure to ultra violet radiation or sunlight, but is not designed for permanent direct exposure. Under such conditions, painting or lagging is required. The pipe should be supported throughout its length to avoid sagging. The pipe should be similarly supported in transit and protected from abrasion and crushing.

Corrosion inhibitors / Prevention

To prevent sludging & corrosion in the heating system, the following appropriate measures should be taken.

Inhibitors: Pipelife fully approves the use of corrosion inhibitors with Easy-Lay PB Barrier Pipe: Easy-Lay PB Barrier Pipe dramatically reduces the ingress of oxygen into the heating system thus reducing the possibility of corrosion of ferrous parts in the heating system.

Hard/Soft Water Areas

In hard water areas, the smooth bore and flexibility of Easy-Lay PB prevents lime scale from adhering to the inner surface of the pipe, therefore Easy-Lay PB is the ideal pipe to use where water is of a temporary hard nature.

Unlike rigid metal pipes, Easy-Lay PB is not dissolved or corroded by soft acidic waters.

INSERTS:

Easy-Lay PB inserts are BS 7291 system approved inserts suitable for use with any BS 7291 approved pushfit fittings and standard compression fittings. Pipelife inserts should be used with Pipelife Easy-Lay PB. However, an alternate BS7291 approved insert may be used. In addition, Pipelife UK will not accept any responsibility or liability for any product or consequential damage caused due to a joint failure when a non BS7291 insert is used on a BS 7291 pushfit fitting or standard compression fitting.

Easy-Lay PB Jointing Guidelines

Using approved Compression Fittings:

1. Cut the Easy-Lay PB pipe squarely. Pipelife recommends the use of
 - a pipe cutter, specifically designed for plastic pipes.
2. Push the Easy-Lay PB support insert into the pipe - it will assist in re-rounding the pipe after the cutting action. This insert will support the pipe in the joint.
3. Follow one of the following methods:-
 - (a) Push the Easy-Lay PB pipe into the compression fitting without removing the capnut and compression ring until it makes firm contact with the pipe stop in the body of the fitting.
 - (b) Remove the capnut and ring from the fitting, place on Qual-PB pipe in logical order and insert the pipe fully into the fitting.
4. In both cases, tighten the capnut by hand as far as possible and then a further 1.5 turns with a spanner / pipe wrench.

Note: A compression joint makes a two point seal which normally eliminates the need for jointing compounds, and sealants. Should it be deemed desirable, an approved jointing compound may be used sparingly at the joint in order to reduce the load required to reach the number of turns. Joints should be wiped clean after completion.

Using Pushfit Fittings -

Although Pushfit Fittings are simple to assemble, it is important to take care while making the joint, to avoid leakages afterwards. Standard good practice according to the following procedure will ensure a trouble free installation.

1. Cut Easy-Lay PB with the correct pipe cutters. Ensure that the pipe
 - is cut straight, and is fully clean and free from grit and swarf.

Note: Any labels on the Easy-Lay PB pipe should be fully removed before inserting the pipe into the pushfit fitting.

2. Insert the correct Easy-Lay PB pipe support sleeve (or another BS:7291 approved insert) into the pipe ensuring it is fully home.
3. Clearly mark the relevant socket depth on the pipe, with a pencil or felt marker.
4. Insert Easy-Lay PB pipe through the release collar to rest against
 - the grip ring. Push the Easy-Lay PB pipe firmly home until it reaches
 - the pipe stop with a positive "click", then twist the pipe or fitting to ensure the sealing ring has not been displaced.
5. Check the fitting has reached the mark.
6. Pull the Easy-Lay PB pipe to ensure that the fitting is secure.

Because a pushfit fitting relies on a 'rubber ring seal' to form a watertight seal, it is extremely important that the fitting and pipe is kept free from dirt and debris before and during installation. Furthermore, the pipe should be checked around the area of the joint prior to assembly, to make sure it has not been damaged.

When a pushfit fitting is de-mounted from Easy-Lay PB pipe, the pipe should be cut back to behind the location of the fitting, in case the pipe has been scored during the demounting process.

Easy-Lay PB Pipe Guarantee Certificate

Easy-Lay PB barrier pipe is manufactured to the Class S requirements of BS7291, the approved service conditions of which are as follows:

- 12 Bar at 20°C
- 7 Bar at 82°C

Easy-Lay PB pipe work is guaranteed for a period of:

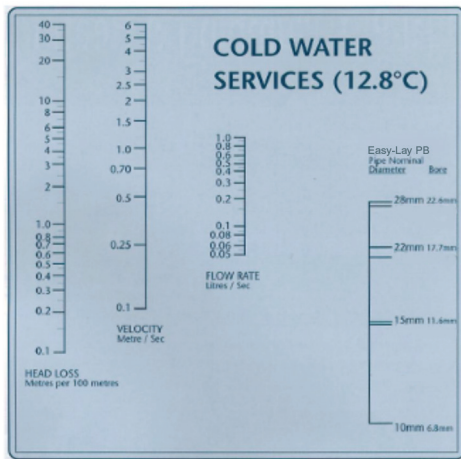
50 years.

Provided Easy-Lay PB installation guidelines are adhered to, the pipe is guaranteed against any manufacturing defects for a period of **50 years**.

Easy-Lay PB Pipe Sizing Guidelines

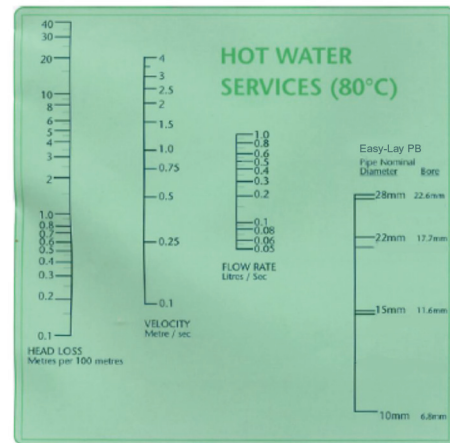
Cold Water Services

1. Start by assuming a particular diameter of Easy-Lay PB pipe.
2. Draw a straight line from the assumed pipe size through the design flow rate required.
3. Continue this line across the Velocity and Head Loss scale.
4. Check that the head loss does not exceed the permissible loss of head per 100m=
Available head x 100 Effective pipe length.
5. Ensure that the flow velocity is not too high i.e. maintain flow velocity below 3m/s.
6. If the checks in 4 and 5 are not valid for the pipe size chosen, then choose the next largest diameter of Easy-Lay PB and repeat steps 1 through 5.



Hot Water Services (80°C)

1. To determine the flow rate that will result from the selected pipe draw a line from the pipe size selected to the permissible loss of head on the left hand Head Loss Axis (see step 4 in Pipe Sizing Method on previous page for calculation). The flow rate is where this line cuts the Flow Rate Axis.
2. To determine the residual head available in that pipe join the pipe size chosen to the flow rate required using a straight line and continue the line through to the Head Loss Axis. The difference between the permissible loss of head and this mark is the residual head in metres per 100 metres.



SOME OF THE QUESTIONS MOST OFTEN ASKED ABOUT Easy-Lay PB

Q: Is Easy-Lay PB approved for drinking water?

A: Yes. Easy-Lay PB is specifically tested and approved to carry drinking water by WRAS.

Q: Can Easy-Lay PB be buried in concrete?

A: Yes. Concrete does not have an adverse effect on Easy-Lay PB and the pipe may be buried directly in concrete (subject to bye-laws). However, in order to avoid heat loss, it is advisable to thermally insulate the pipe.

Q: Does Easy-Lay PB require lagging under floors?

A: Lagging is not required under intermediate floors, but should be used where Easy-Lay PB is run under ground floors or in unheated spaces, for frost protection and energy conservation. Heat loss is less from Easy-Lay PB than from rigid pipes, and Easy-Lay PB is resistant to bursting down to -20°C.

Q: Does Easy-Lay PB reduce installation time and cost?

A: Yes. Once the installer gets used to working with Easy-Lay PB, up to 40% savings can be made in the labour content.

Q: Can inhibitors be used on Easy-Lay PB?

A: Yes. Inhibitors are recommended for all heating systems.

Q: What effect does hard water have on Easy-Lay PB?

A: The smooth bore and flexibility of Easy-Lay PB prevents lime scale adhering to the inner surface of the pipe.

Q: What effect does soft water have on Easy-Lay PB?

A: None. Unlike rigid metal pipes, Easy-Lay PB is not dissolved or corroded by soft acidic water.

Q: Can Easy-Lay PB be used on solid fuel central heating systems?

A: Easy-Lay PB can be used on the secondary side of a solid fuel heating system. Easy-Lay PB should not be used for primary pipework on gravity systems.

Q: Can Easy-Lay PB be used on sealed central heating systems?

A: Yes, provided the maximum system service temperature is less than 92°C.

Q: Can Easy-Lay PB be painted?

A: Yes. Easy-Lay PB can be painted.

Q: Can Easy-Lay PB be used for gas pipe or for carrying oil?

A: No. Easy-Lay PB is only guaranteed for use with water

Q: Are Pipelife fittings subject to damage if flux ingress arises from soldered fittings (e.g. demounting & grip-ring/support ring).

A: Yes, no fluxes of any type should come in contact with Pipelife UK pipe and fittings. If fluxes are to be used in an environment where our fittings are installed, then extreme care should be taken to ensure that no such contact takes place.

Q: Do Pipelife have any guidance or recommendations with regard to ClO 2 (chlorine dioxide) levels?

A: Yes, Pipelife UK pipe and fittings are not suitable for use in systems which have high concentrations of chlorine, e.g. swimming pools. Short term chlorination for disinfection will not have an adverse effect on the system. Sustained exposure to chlorine levels above 0.5ppm should be avoided, however these concentrations do not normally arise in potable water supplies.

Q: Do Pipelife have any guidance or recommendations with regard to the use of trace heating tapes?

A: Trace heating tape has no adverse reaction on Pipelife PB pipe as long as it does not exceed the maximum temperatures as per Pipelife guidelines. Trace heating generally works on very low temperatures, and will be well below the maximum temperatures recommended by Pipelife.

Q: Do Pipelife recommend pressure testing with Air or Water?

A. We do not recommend pressure testing of joints with compressed air, only water for pressure system testing. Water will detect any leaks and is far safer. N.B. In winter, (freezing conditions), due care must be taken to avoid damage to pipes in the event of water freezing in the pipes. This causes catastrophic damage to PB pipes. Refer to BS EN 806-4