



Plumbers Technical & Installation Manual



0800 BUTELINE
www.pexline.com

Contents

Buteline and Our Commitment	1
The Pexline Plumbing System	2
Why Choose the Pexline Plumbing System	3
Green, Sustainable Plumbing	4
Pexline Plumbing System - 16mm, 20mm & 25mm Range	5
Pexline Fittings	9
Pexline PE-X Pipe	10
Pexline Clamp Tools	11
Installation Demo for Pexline ProClamp Tools & 25mm Clamp Tool	12
Adjustment Instructions for Pexline ProClamp Tools	13
Adjustment Instructions for 25mm Clamp Tool	14
Installation Guide	15
Use Only the Complete Pexline System	18
Storage and Handling	19
Feeding Pexline PE-X Pipe Through Timbers	20
Bending Radius	21
Pipe Clipping	22
Pexline Threaded Connections & Swivel Connections	23
Connecting PE-X to Copper (Brazing Tails)	24
Connecting PE-X to PB & Connecting PN16 PE-X to PN20 PE-X	26
Installing Pexline Underground	27
Installing Pexline in Concrete / Masonry / Marine / Chlorine Environments	28
Freezing Conditions & UV Exposure	29
Fire Protection	30
Working Pressure	31
Pipe Pressure Head Loss for PE-X Pipe	32
Hot Water Installations	33
Typical High Pressure Hot Water Cylinder	34
Typical Low Pressure Hot Water Cylinder	35
Solar Hot Water & Recirculated Hot Water Systems	36
Is Pexline Suitable for use with Re-circulated Hot Water Systems?	37
Non-Potable Water Piping & Other Uses for Pexline	38
Installation Checklist	39
Typical Method of Plumbing	40
Definition of Terms	42
Pressure Conversion Chart	44
The Pexline Guarantee	45

Buteline And Our Commitment

Buteline is proud to be a **New Zealand owned and operated** company, originally specialising in the manufacture of the popular Buteline Polybutene-1 (PB-1) Plumbing System.

Established in 1980 and based in East Tamaki, Auckland, Buteline have grown from a small family business to a multinational company exporting to Australia, Malaysia, United Kingdom and other overseas markets.

The Bute-Pexline ("Pexline") Plumbing System has been developed as an innovative solution reflecting recent market trends, and offers an additional plumbing system to discerning plumbers and architects/specifiers.

Product quality control and assurance are of utmost importance, with in-house test equipment and certified independent laboratories closely monitoring quality and conducting product testing.

The Pexline Plumbing System complies with the Australian and New Zealand joint standards AS/NZS 2492, AS/NZS 2537, AS/NZS 4020 and Watermark, and is covered by extensive worldwide patents.

A strong commitment to continuing research and development ensure that Buteline will remain leaders in plumbing technology. Our engineers and technical team thrive on the challenges presented with ongoing new product development.



For a free guided tour of Buteline's manufacturing plant in East Tamaki, Auckland, please freephone 0800 BUTELINE.

The Pexline Plumbing System

Buteline has developed an alternative solution to the need for a safe, integrated and easy to use potable water plumbing system. The resultant Cross-Linked Polyethylene (PE-X) system is designed specifically for professional plumbers and is both high quality and economical.

It is strongly recommended that tradesmen use the total Pexline system, i.e. Pexline clamp tools, Pexline PE-X pipes and clips, and Pexline fittings, to ensure total compatibility of installations.

When installed in accordance with recommendations contained herein, the complete system is fully guaranteed by Buteline (see page 45).



Why Choose The Pexline Plumbing System

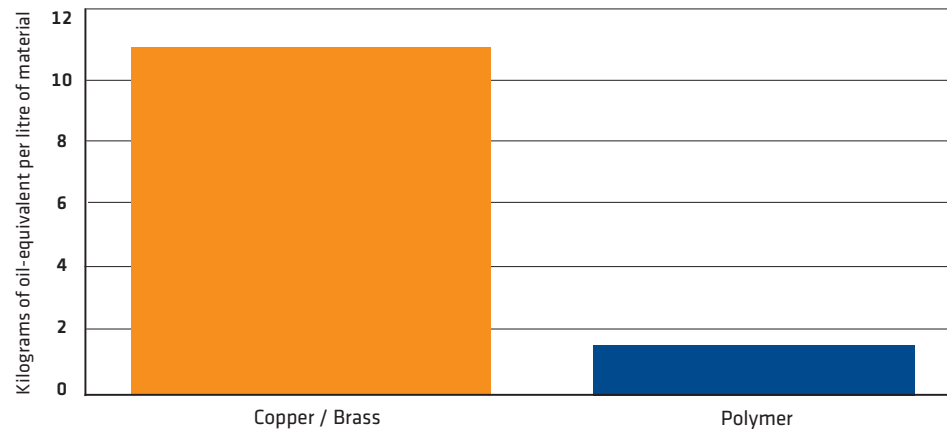
- ✓ The Pexline System is designed in New Zealand, with the polymer fittings being made in New Zealand, and other quality components being sourced from verified overseas suppliers to supplement the system.
- ✓ The Pexline System has been designed specifically for use by tradesmen, and meets the requirements of AS/NZS 2492, AS/NZS 2537 and Watermark.
- ✓ Similar to Buteline fittings, Pexline fittings have a one-piece design concept, incorporating factory fitted clamp rings which ensures high productivity, while providing the strongest reinforced joint available. The polymer has excellent chemical resistance and high tensile strength.
- ✓ Pexline fittings are light-weight and easy to transport, with no additional parts such as O-rings, grab rings and pipe inserts. Brass fittings are made of solid DZR brass.
- ✓ Pexline clamp tools have been designed and engineered for ease of use, to give quick installation and a professional result every time.
- ✓ NZ owned and operated, the team at Buteline NZ Ltd are readily available to assist you with the best customer service when and where required.



Green, Sustainable Plumbing

- ✓ Pexline polymer fittings are lightweight, from raw material to finished product = Reduced fuel use and less pollution
= Low carbon footprint
- ✓ Durability of at least 50 years = Sustainable
- ✓ Recyclable materials = Less wastage
- ✓ Hygienic, non-toxic and safe
- ✓ Less energy required to manufacture polymers than for competing materials such as brass and copper

Amount of energy required to manufacture 1 litre of material



Pexline Plumbing System - 16mm, 20mm & 25mm Range



EQUAL TEES

PT16 - 16mm x 16mm x 16mm
PT20 - 20mm x 20mm x 20mm
PT25 - 25mm x 25mm x 25mm



REDUCING TEES

PTR112 - 16mm x 16mm x 20mm
PTR211 - 20mm x 16mm x 16mm
PTR212 - 20mm x 16mm x 20mm
PTR221 - 20mm x 20mm x 16mm



REDUCING TEES

PTR522 - 25mm x 20mm x 20mm
PTR525 - 25mm x 20mm x 25mm
PTR551 - 25mm x 25mm x 16mm
PTR552 - 25mm x 25mm x 20mm



INLINE COPPER TO PE-X PIPE TEE

PTC16B - 1/2" BSP x 1/2" BSP x 16mm to fit 15mm Cu.



STRAIGHT FEMALE SWIVELS

PF325 - 3/4" BSP x 25mm
PF125 - 1" BSP x 25mm



BRASS FEMALE SWIVELS

PF16B - 1/2" BSP x 16mm
PF20B - 3/4" BSP x 20mm

BRASS REDUCING FEMALE SWIVEL

PF2016B - 3/4" BSP x 16mm



INLINE COUPLINGS

PS16 - 16mm x 16mm
PS20 - 20mm x 20mm
PS25 - 25mm x 25mm



REDUCING COUPLINGS

PS2016 - 20mm x 16mm
PS2520 - 25mm x 20mm



BRASS MALE ADAPTORS

PM16B - 1/2" BSP x 16mm
PM20B - 3/4" BSP x 20mm
PM2016B - 3/4" BSP x 16mm
PM25B - 1" BSP x 25mm

Pexline Plumbing System



FEMALE BRAZING TAILS

PBTF16 - 1/2" NZ Cu x 16mm
PBTF20 - 3/4" NZ Cu x 20mm



POLYMER TRANSITION FITTINGS

PPB1612 - 16mm PEX x 12mm PB
PPB1615 - 16mm PEX x 15mm PB
PPX1616 - 16mm PEX x 16mm PN20 PEX
PPB2020 - 20mm PEX x 20mm PB
PPX2020 - 20mm PEX x 20mm PN20 PEX
PPB2528 - 25mm PEX x 28mm PB
PPX2525 - 25mm PEX x 25mm PN20 PEX



EQUAL ELBOWS

PE16 - 16mm x 16mm
PE20 - 20mm x 20mm
PE25 - 25mm x 25mm



45 DEGREE ELBOWS

PE4516 - 16mm x 16mm
PE4520 - 20mm x 20mm
PE4525 - 25mm x 25mm



BRASS FEMALE SWIVEL ELBOWS

PFE16B - 1/2" BSP x 16mm
PFE20B - 3/4" BSP x 20mm
PFE1620B - 1/2" BSP x 20mm



BRASS MALE/FEMALE SWIVEL ELBOW (CHROMED)

MFE1C - Male 1/2" BSP x Female 1/2" BSP



BRASS MALE/FEMALE SWIVEL ELBOW

MFE2 - Male 3/4" BSP x Female 3/4" BSP



BRASS MALE ELBOW

PME16B - 1/2" BSP x 16mm



HOSE PLATE

PHP16 - 1/2" BSP x 16mm

16mm, 20mm & 25mm Range



FEMALE WING BACK ELBOWS

PWE16 - 1/2" BSP x 16mm
PWE20 - 3/4" BSP x 20mm
PWE2016 - 3/4" BSP x 16mm
PWE25 - 1" BSP x 25mm



DOUBLE FIX FEMALE WING BACK ELBOW

PWED16 - 1/2" BSP x 16mm



TOP FIX FEMALE WING BACK ELBOWS

PWET16 - 1/2" BSP x 16mm
PWET20 - 3/4" BSP x 20mm



MALE WING BACK ELBOWS

PWM16 - 1/2" BSP x 16mm x 70mm
PWM100 - 1/2" BSP x 16mm x 100mm
PWM200 - 1/2" BSP x 16mm x 200mm
PWM202 - 3/4" BSP x 20mm x 200mm



TOP FIX MALE WING BACK ELBOWS

PWM216 - 1/2" BSP x 16mm x 200mm
PWM220 - 3/4" BSP x 20mm x 200mm



PIPE END PLUGS

PPG16 - 16mm
PPG20 - 20mm
PPG25 - 25mm



MASONRY NAIL PIPE CLIPS

PBA16 - 16mm
PBA20 - 20mm
PBA25 - 25mm



CONCRETE NAIL PIPE CLIPS WITH ANCHOR

PBA16A - 16mm
PBA20A - 20mm



PEXLINE PIPE

PXC16 - 16mm x 50m Coil
PXC16100 - 16mm x 100m Coil
PXC20 - 20mm x 50m Coil
PXC20100 - 20mm x 100m Coil
PXC25 - 25mm x 50m Coil
PXL16 - 16mm x 5m Lengths
PXL20 - 20mm x 5m Lengths
PXL25 - 25mm x 5m Lengths

Pexline Plumbing System



PEXLINE PIPE

For Hot Water

PCH16 - 16mm x 50m Coil
PCH20 - 20mm x 50m Coil
PLH16 - 16mm x 5m Lengths
PLH20 - 20mm x 5m Lengths



PEXLINE PIPE

For Cold Water

PCC16 - 16mm x 50m Coil
PCC20 - 20mm x 50m Coil
PLC16 - 16mm x 5m Lengths
PLC20 - 20mm x 5m Lengths



GREY WATER / RECYCLED WATER PEXLINE PIPE

PCL16 - 16mm x 50m Coil
PCL20 - 20mm x 50m Coil
PLL16 - 16mm x 5m Lengths
PLL20 - 20mm x 5m Lengths



PEXLINE PIPE IN CONDUIT

PXC16C - 16mm x 50m Coil
PXC20C - 20mm x 50m Coil



PIPE BEND SUPPORTS

PBS16 - 16mm
PBS20 - 20mm
PBS25 - 25mm



PROCLAMP TOOLS

PROX16 - 16mm
PROX20 - 20mm

CLAMP TOOLS

FRX25 - 25mm
Includes checking gauge.



ELECTRIC CLAMP TOOL & JAWS

PET01 - Boxed kit includes tool with battery, charger and a set of 3 jaws.

PETJ16 - 16mm jaws
PETJ20 - 20mm jaws
PETJ25 - 25mm jaws

Jaws for the electric tool are also available individually for purchase.



PIPE CUTTER

PC30 (Yellow)



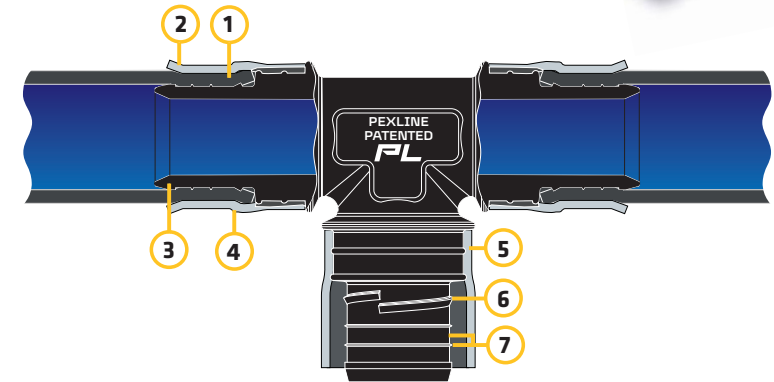
PEXLINE FITTINGS CASES

PEXFC - A quality fittings case with a selection of Pexline fittings.
PEXC - This tough and durable tradesman's case is also available empty.

Pexline Fittings

Buteline have developed an extensive range of quality fittings which have complete compatibility with Pexline PE-X pipe.

The annealed protective metal sleeve is precisely attached to each fitting during production and is designed to provide a unique metal reinforced joint. Users of Pexline fittings will therefore find the total concept much quicker and more economical than other available systems.



- 1 WIDE FORGED CLAMP**
Minimum working stress applied (approx. 0.5 ton per sq. in.) allowing pipe material to "flow" into insert tail grooves.
- 2 2mm WIDE FLARE**
No stress from clamping transmitted to insert tail or pipe at end of fitting. End of metal sleeve cannot impinge into pipe, even in bending.
- 3 TAPERED ENTRY, SMOOTH BORE**
Minimise resistance to water flow.
- 4 METAL REINFORCING SLEEVE**
Guarantees no stress break in this critical area.
- 5 FULL LENGTH ALUMINIUM SUPPORT**
Provides additional rigidity and resistance to pull-off. Seals against dirt and moisture.
- 6 SUREFIT HELIX**
Patented design feature prevents pipe from falling off sleeve, ensures precise positioning.
- 7 SEALING RIBS**
Narrow lands with wide grooves, ensure clamp stress is transferred into the pipe joint efficiently.

Pexline PE-X Pipe

Pexline pipe is PN16 PE-Xb pipe and produced in 16mm, 20mm and 25mm. All three sizes are supplied in 5m straight lengths, and 16mm, 20mm & 25mm are also supplied in 50m coils. 16mm & 20mm carbon black PE-X pipe are also available as 100m coils.

Pipe identification marks are printed at 1 metre intervals and indicator lines provide a guide during installation.

Pexline pipe meets the exacting Australian and New Zealand Standard AS/NZS 2492.

Pexline pipe is approved for use on both hot and cold potable water services. It also complies with the AS/NZS 4020 Food Grade Standard.

Tough and non-corrosive, Pexline PE-X pipe can withstand high temperatures and pressures (see page 31).



Pre-sleeved 16mm & 20mm PE-X pipe in conduit is also available in 50m coils.

Conduits embedded in floors or walls should comply with the New Zealand Building Code.

Pexline Clamp Tools

Buteline have engineered their clamp tools to ensure a simple, controlled, accurate joint every time. They have a “head” design which permits easy access and alignment.

The Pexline clamp tool is available in three sizes to suit 16mm, 20mm and 25mm Pexline fittings.



PE-X Clamp Tool
25mm



PE-X ProClamp Tools
16mm & 20mm



Mini Electric Clamp Tool
& Jaws

Servicing Your Clamp Tool

Pexline clamp tools are a very important part of the system. They are robust and designed to perform up to a consistent high standard. Service your clamp tool by cleaning and oiling moving parts regularly. WD40 is an ideal cleaner/lubricant.

The Buteline 15mm PRO18 ProClamp tool may be used to clamp 16mm Pexline fittings. All other Pexline clamp tools must only be used with the Pexline Plumbing System.

Installation Demonstration for Pexline ProClamp Tools & 25mm Clamp Tool



1. Cut the pipe on an indicator line with the Pexline pipe cutter.



2. Insert the pipe into the Pexline fitting. Ensure you push the pipe all the way (14mm) with a slight twist to 'SureFit' onto the shoulder of the fitting, up to the next indicator line of the same size.



3. *Clamp-Hold-Release*
Clamp once only approximately 2mm in from the end of the clamp ring. Close the clamp tool handles completely, holding firmly until the ratchet allows the handles to open and release.



4. Use the gauge provided to check that the full clamp force has been achieved. If the gauge does not pass over the ring, the ring is under-clamped. It is important that the gauge passes over the clamp ring. Take corrective action by re-adjusting the tool (see pages 13 & 14) and then re-clamping.

16mm & 20mm Pexline ProClamp Tool Adjustment Instructions



1. Identify the position of the adjuster cam.



2. Turn the tool over and remove the circlip securing the adjuster cam.



3. Retain the circlip for replacement after adjustment.



4. Push the adjuster cam out from the circlip side until the hexagon head of the cam disengages from the handle, and turn the cam clockwise, so that it is moved around 1 flat of the hexagon.

5. Push the hexagonal head of the cam back into the handle and replace the circlip to retain the adjuster cam.

NOTE: The maximum adjustment has been achieved when the adjusting cam has been rotated 180°. Do not adjust your ProClamp Tool more than 5 times in its life cycle.

25mm Pexline Clamp Tool Adjustment Instructions



1. Open the tool and remove the screw.



2. Lift the adjuster and rotate *clockwise* by 1 notch.



3. Replace the screw.



4. Check for correct clamp width.

Installation Guide

Carry out installations with a professional manner.
Use the complete "Pexline" system – clamp tools, pipe, fittings, etc.

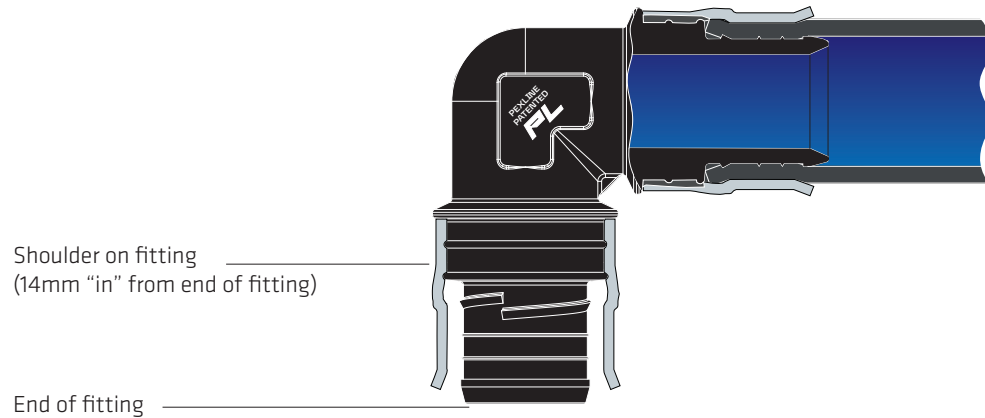
Preparation Of PE-X Pipe

- (a) Pipe must be clean and free from grease or any other contamination.
- (b) Pipe must have no kinks, buckled sections, deep scores, etc.
- (c) When measuring, allow 15mm of pipe for each fitting.
- (d) Allow enough length for expansion / contraction (minimum 10mm per metre).
- (e) Cut the pipe to length squarely and cleanly on an indicator line using only approved pipe cutters.

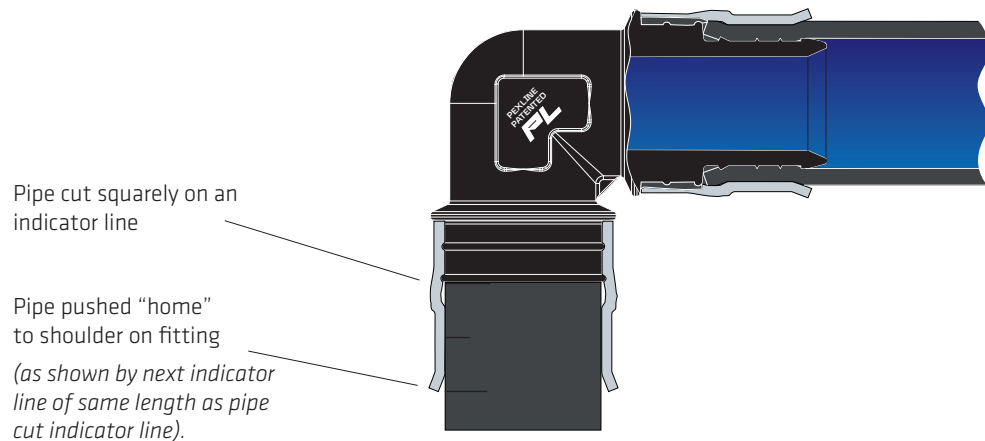


Position Of Fittings

- (a) Pre-position fittings correctly on the pipe to achieve alignment with all other pipework prior to final clamping.



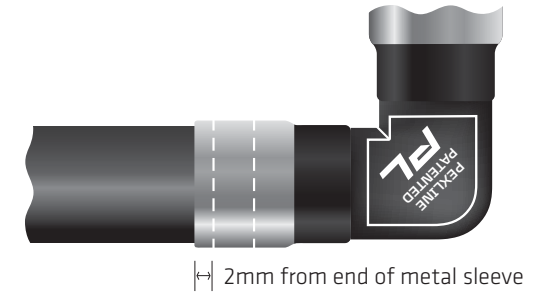
- (b) Fully insert (push home to shoulder) with a slight twist to SureFit the PE-X pipe into Pexline fittings, up to the next visible indicator line of the same size to ensure full engagement of pipe into the fitting.



Clamping Pexline Fittings

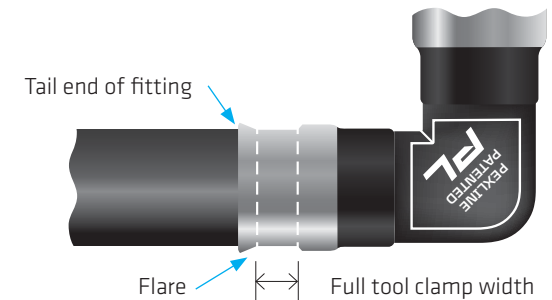
- (a) Position the Pexline clamp tool squarely and approximately 2mm in from the end of the factory fitted reinforcing clamp ring.

Correct Clamp Tool Position



- (b) Close clamp tool handles completely (to the stops provided, if applicable), hold fully closed for approximately 2 seconds, then release.
- (c) A good clamp will produce a "flare" at the end of the reinforcing ring. The "flare" shows that the full clamp width has been applied to the joint - and the designed result achieved. (It is important that a full clamp width is achieved).

Correct Appearance Of Best Joint



INSTALLER NOTE:

Failing to install Pexline fittings as advised in this Installation Manual voids all warranties. If joints are not made as per this manual, please remove and replace with a new fitting.

- (d) Be methodical - ensure you clamp all fittings on the job, and do not double clamp.

- (e) All joints must be clamped squarely across the fitting as angled clamping can lead to unacceptable stress levels being imparted onto the fitting and pipework which could lead to premature failure.

Use Only The Complete Pexline System

The use of the complete Pexline System (Pexline pipe, Pexline fittings, Pexline clamp tools) is imperative for a number of reasons:

- ✓ **Buteline offers a guarantee ONLY when the complete Pexline System (Pexline PIPE, Pexline FITTINGS, Pexline TOOLS) is used.**
- ✓ Pexline pipe is made to specific tolerances for use with the Pexline fittings to give a strong, leak-proof and PERMANENT joint every time. Only Pexline pipe is manufactured to the exacting standard demanded by the Pexline range of fittings.
- ✓ The exclusive use of Pexline components ensure a PROFESSIONAL TRADESMAN-LIKE job every time.

The complete Pexline Plumbing System offers the plumber many advantages, including:

- ✓ **Speed:**
The Pexline clamping method is one of the fastest, most reliable PE-X plumbing systems available.
- ✓ **Extensive product range:**
Useful and innovative fittings specifically designed and engineered for the professional plumber.
- ✓ **Total commitment and dedication to the plumbing industry:**
Buteline is a specialist in plumbing systems and will always be the leader in plumbing systems.

Storage and Handling

- (a) Store fittings so that they cannot be damaged by heavy tools, etc. It is a good idea to have a tool box to carry the large range of fittings available.
- (b) Take care to keep the Pexline Plumbing System away from chemicals, solvents, cements, oxidising agents or petroleum products.
- (c) Store the Pexline system away from direct sunlight and high temperature sources (e.g: heaters, boilers, gas / central heating / appliance vents).
- d) Avoid dragging pipe across rough surfaces to prevent possible damage to pipe surface.



Call 0800 BUTELINE or your local representative for more information about a Pexline fittings case. Available from your plumbing merchant.

“Feeding” Pexline PE-X Pipe Through Timbers

- (a) “Pipe sleeves” and bored holes should be large enough to allow free movement of Pexline PE-X pipe.

Minimum Hole Sizes:

Use 20mm drills for – 16mm pipe
Use 25mm drills for – 20mm pipe
Use 32mm drills for – 25mm pipe

- (b) Larger holes may be required to ease pipe through if changing direction.



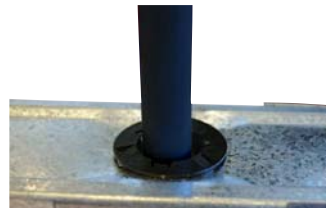
- (c) Use of silicone in the holes is not required.

NOTE:

If sealing Pexline pipe where it passes wooden framing, a natural cure silicone can be used. Do not use an acid cure silicone sealing system as this may have a detrimental effect on the PE-X pipe.

NOTE:

If running Pexline PE-X pipe through steel framing, use plastic grommets (as supplied by the steel frame fabricator) to protect the pipe from sharp metal edges.



Bending Radius

Pexline PE-X pipe should be installed ensuring any bending radius is at least 10 times the outside diameter of the pipe.

Sharp bends should be made with appropriate fittings or by using Pexline pipe bend supports. It is recommended that pipe bend supports are used on hot lines to prevent possible kinks in the pipes.

Pipe Size	Minimum Bending Radius
16mm (O.D. 16mm)	160mm
20mm (O.D. 20mm)	200mm
25mm (O.D. 25mm)	250mm



Pipe Clipping

There are 2 types of Pexline pipe clips available:



Timber / masonry clip



Concrete nail pipe clip with anchor

- (a) Remember that Pexline PE-X Pipe is flexible but must not be “anchored tightly” between two points.
- (b) Pipes unsupported by clips are unsightly and can be damaged.

Maximum Spacing of Clips (metres)		
PE-X Pipe	Horizontal or graded pipes	Vertical pipes
16mm	0.6m	1.2m
20mm	0.7m	1.4m
25mm	0.75m	1.5m

Pexline Threaded Connections

It is essential to use (PTFE) pipe thread tape - use a small amount and wrap correctly onto male thread connectors (PME16B, PM20B, etc).



Pexline Swivel Connections

- (a) Ensure that when using female swivel connectors, the shoulder of the female is directly presented squarely to a flat machined face before tightening. This avoids crossed threads and ensures a seal. No (PTFE) pipe thread tape or sealant required.



- (b) When connecting copper pipe to Pexline fittings (PTC16B), use only an olive (plastic ‘relf’ ring or similar), or crox and connect - there is no need for hemp.
- (c) When installing all male or female threaded fittings, best practice is to fit and tighten the threaded end of the fitting PRIOR to clamping the pipe onto the tail of the fitting.

Connecting PE-X to Copper (Brazing Tails)



Before commencing any work involving heat processes, be sure to check that hot work is permitted.

1. Cut the copper pipe to length, ensuring the end is square and clean.



2. Slide the brazing tail socket onto the copper pipe, ensuring that the aluminium and polymer clamp ring assembly has been removed.



3. Use suitable flux and SilFos to make the joint between the fitting and the copper pipe.



4. AFTER the solder joint has COOLED, slide the aluminium clamp ring assembly onto the Pexline tail of the fitting, ensuring it goes fully up to the fitting shoulder.



5. Simply insert the PE-X pipe into the Pexline fitting and push fully home to the shoulder of the fitting.



6. *Clamp - Hold - Release*

- Clamp the Pexline fitting, using ONLY the Pexline clamp tool.
- Position the Pexline clamp tool squarely, approximately 2mm in from the end of the clamp ring.
- Close handles completely, holding in the tightly closed position for around 2 seconds to ensure that the flow of material is performed. Open and remove the tool.



7. Finished.

- The process is complete!
- Installing the Pexline System is quick and secure and always provides a visual indicator of joint completion.

Transition Fittings: PE-X to PB and PN16 PE-X to PN20 PE-X

The Pexline Plumbing System has a range of adaptors, for connecting to PB, or to PN20 PE-X, some of which are identified by a coloured plastic ring.

The below transition fittings offer options to connect to existing installations where required.



PPB1612
16mm PE-X x 12mm PB



PPB1615
16mm PE-X x 15mm PB



PPB2020
20mm PE-X x 20mm PB



PPB2528
25mm PE-X x 28mm PB



PPX1616
16mm PE-X x 16mm PN20 PE-X



PPX2020
20mm PE-X x 20mm PN20 PE-X



PPX2525
25mm PE-X x 25mm PN20 PE-X

Installing Pexline Underground

- (a) If 'jointing' underground or in a marine environment is necessary, wrap the aluminium rings directly and completely using a waterproof insulation tape.



- (b) In areas of corrosive soil that consist of substances such as:
- Magnesium oxychloride (magnesite)
 - Coal wash
 - Acid sulphate soils
 - Sodium chloride (salt)
 - Ammonia
 - Lime

The metallic surface of Pexline fittings (brass / aluminium) must be continuously wrapped in a petrolatum taping material (waterproof) as per AS/NZS 3500.

- (c) New water mains – take Pexline PE-X 20mm / 25mm pipe from water meter to dwelling. This practice will give maximum water flow at all service points.
- (d) Lay Pexline PE-X pipe in the bottom of the trench - check that there are no sharp objects that may penetrate or damage the pipe.
- 'Snake' the pipe the entire length underground to allow for expansion and contraction.
- (e) Trench depth and installation must conform to plumbing and drainage regulations.

Installing Pexline in Concrete / Masonry

- (a) Use a pipe sleeve or conduit pipe when burying Pexline PE-X pipe in concrete. Pipe sleeves should be large enough to allow free movement for expansion and contraction.
- (b) A pipe sleeve is not required when installing a low temperature / pressure underfloor heating system (refer to manufacturer).
- (c) Pexline PE-X pipe installed in concrete slabs, footings etc. must have no joints, and must be in accordance with local building codes (AS/NZS 3500 Parts 1 & 4).
- (d) When installing in concrete / cement plastered walls, use a pipe sleeve to allow free movement for expansion and contraction. If jointing is necessary, wrap the aluminium rings directly and completely using a waterproof insulation tape such as Denso Tape or PVC insulation tape (shown as point (a) on page 27).

Installing Pexline in Marine Environments

When installing in marine environments where the fittings are subject to salt water exposure, wrap the aluminium rings directly and completely using Denso Tape or PVC insulation tape (shown as point (a) on page 27).

Chlorine

Pexline pipe should not be installed in areas where the water supply is likely to have chlorine content of over 2 parts per million, as this will shorten its working life. Check with your local territorial authority/water utility.

Before using PE-X pipe other than for potable water, always check with the manufacturer. If the pipework is to be installed in a known contaminated area, in contaminated soils or in an area which may be subject to chemical spills, check with manufacturer.

Freezing Conditions

Pexline PE-X pipe is a good choice for water reticulation in climates where freezing conditions are possible.

Pexline PE-X pipe will absorb the expansion of frozen water within itself and will absorb the additional expansion created by the water freezing inside a rigid fitting and expanding into the pipe.

Minimise possible problems by taking the following precautions:

- ✓ Make sure that any metal pipe to PE-X pipe joints are made in a non-freezing area.
- ✓ Ensure 150mm between fittings so that ice expansion from a rigid pipe or joints can be absorbed by the PE-X pipe.
- ✓ Bury PE-X pipe where practical, if fittings are buried wrap the aluminium rings.
- ✓ Insulate PE-X pipe heavily where freezing conditions may prevail.
- ✓ Avoid placing PE-X pipework within 'polar-facing' walls, where practical.

UV Exposure

Pexline PE-X pipes meet the requirements of AS/NZS 2492 relating to UV stability. However good plumbing practice would see adequate protection against exposure to direct sunlight when located (either vertically or horizontally) on the exterior of a building, either using pipe sleeving, lagging or water-based paint.

Fire Protection

Pexline PE-X pipe which penetrates fire resistant construction must be installed to ensure the fire resistant integrity of the building is retained (refer to local building code).

To achieve the fire rating that is required for the nominated building specification, fire rated silicone and fire collars are suitable for use with the Pexline Plumbing System.

Riser ducts are constructed to achieve a specific fire rating for the building, and fire collars or fire rated silicone (or similar) will need to be used for each service penetrating a wall or floor.

(Floor) riser ducts are typically required to have a 4 hour fire rating.

Walls are typically required to have a 2 hour fire rating.

Under the NZ Building Code requirements for passive fire protection, it requires fire stopping of service penetrations to be tested to Australian Standards.

Australian Standards (AS 1530-4) for Fire Rating and the Building Code of Australia

AS 1530-2005 is the Australian Standard for methods for fire tests on building materials, components and structures. The standard provides requirements for heating conditions, test procedures, and criteria for determining the fire resistance of an element of building construction to building designers, manufacturers, test laboratories and regulatory authorities. This Standard is referenced in the Building Code of Australia and New Zealand and Part 4 of this Australian Standard details the fire resistance testing of elements of construction, which covers testing of fire resistance relating to installation of PE-X systems in buildings.

Fire collars are available from Allproof Industries, please contact them for more information (www.allproof.co.nz).

Working Pressure

As stipulated in ISO 10508, the lifetime of PE-X pipe is 50 years and longer according to permissible working pressure / temperature.

Pexline PN 16 PE-X Pipe

Temperature	Pressure	
°C	kPa	P.S.I.
20	1600	232
40	1480	214
60	1280	186
80	1050	152

NOTE: These pressures are maximum for each temperature level and should not be exceeded.

Pexline PE-X pipe has a recommended maximum long term operating temperature of 90°C and is not recommended for applications where the continuous operating temperature may exceed this limit. Buteline will not guarantee its PE-X pipe and fittings system where long term operating may exceed 90°C.

Buteline recommends that a suitable pressure limiting valve is installed on the inlet side of the property to ensure water pressure does not exceed pipe pressure limits.

Pipe Pressure Head Loss for PE-X Pipe

Pressure / Head Loss per 30 Metres (100 Feet) of Pipe

Minimum Flow Required / Min		16mm		20mm		25mm	
Litres	Gallons	kPa	P.S.I.	kPa	P.S.I.	kPa	P.S.I.
18.0	4	180	26.1	20	2.9	30	4.35
22.5	5	240	34.8	90	13.05	15	2.18
27.0	6	420	60.9	120	17.4	60	8.7
31.5	7	540	78.3	180	26.1	75	10.9
36.0	8	750	109	210	30.5	100	14.5
40.0	9	900	130.5	270	39.2	120	17.4
45.0	10	1200	174	360	52.2	156	22.6

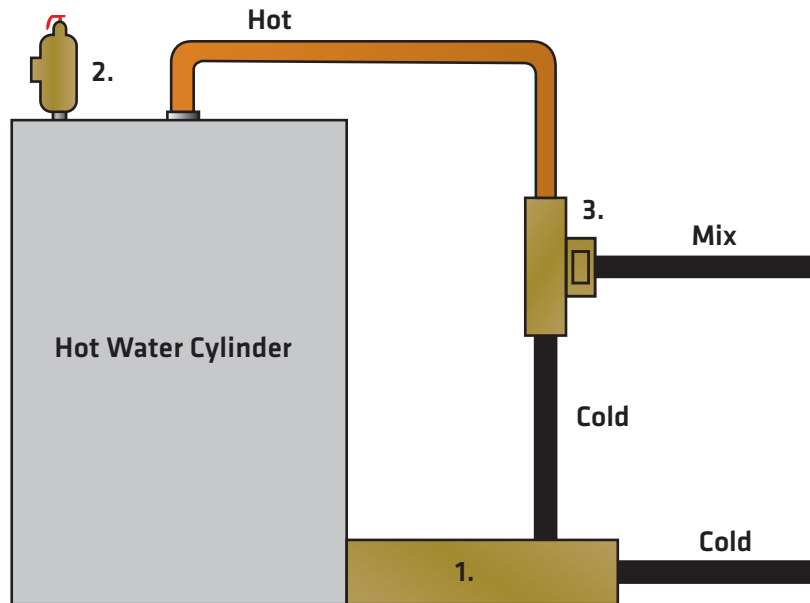
Please refer to page 44 for a Pressure Conversion Chart.

Hot Water Installations

- Pexline PE-X installations should have a minimum of 1 metre of copper tube from the hot water cylinder. When using a tempering valve, use Pexline PE-X pipe direct from mixing outlet.
- All installations supplying hot water that are to be utilised for personal hygiene require a tempering valve to be installed on the outlet side of the hot water cylinder. This ensures safe temperatures for the householder at the tap.
- Instantaneous domestic water heaters do not require 1 metre of copper tube on the outlet. Pexline PE-X pipe can be connected directly to the outlet.
- Do not use PE-X pipe for “wet back” to cylinder plumbing as wet backs constantly exceed 90°C.
- When commissioning the plumbing system, set and test the temperature of the hot water cylinder. Hot water cylinder thermostats should be set at a maximum of 60°C as part of the test procedure.

With a setting of 60°C the hot water system can be maintained within operating requirements and a long service life is expected for the complete plumbing system.

Typical High Pressure Hot Water Cylinder



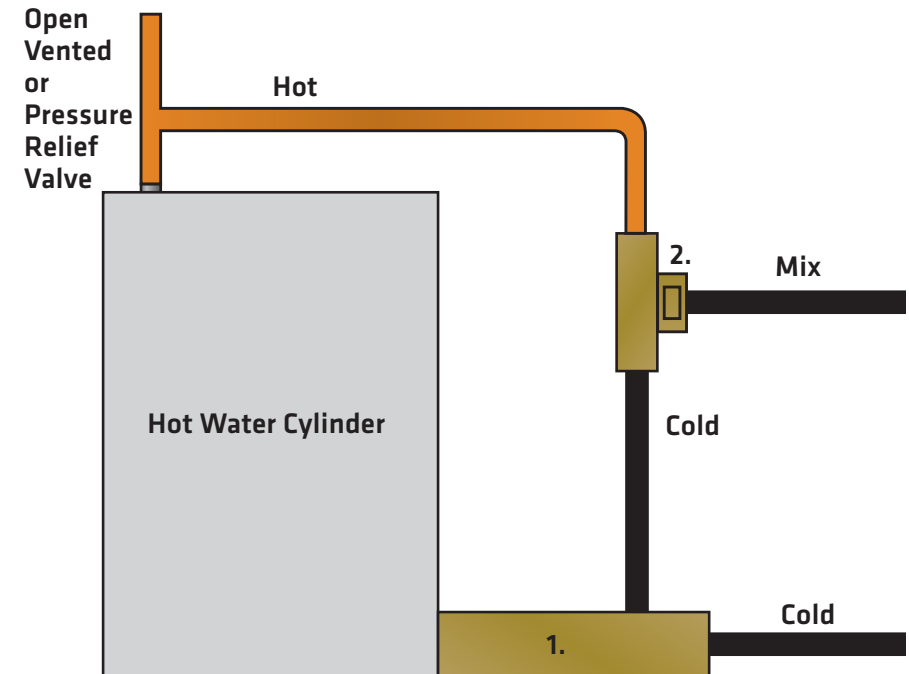
Pexline PE-X Pipe
Copper Pipe (minimum 1m)



1. Non-Return Valve
Isolating Valve
Expansion Valve
Limiting Valve
2. Temperature Pressure Relief Valve
3. Tempering Valve

* Ref AS/NZS 3500.4:2003

Typical Low Pressure Hot Water Cylinder



Pexline PE-X Pipe
Copper Pipe (minimum 1m
to tempering valve)



1. Pressure Reducing Valve
Non-Return Valve
Isolating Valve
2. Tempering Valve

* Ref AS/NZS 3500.4:2003

Solar Hot Water

As solar hot water systems are an uncontrolled heat source, temperatures over 90°C are frequently experienced, therefore the Pexline Plumbing System must be installed in a manner to protect the system from excessive temperatures.

- The Pexline Plumbing System is able to be connected to a solar heated storage cylinder outlet provided it is connected after an approved solar tempering valve only.
- Individual tempering valves are then fitted as required to control water supply temperature to the wet areas in accordance with AS/NZS 3500 Part 4.2.
- Do not use PE-X pipe for solar heater-to-cylinder plumbing.

Re-circulating Continuously Operating Ring Main Hot Water Systems

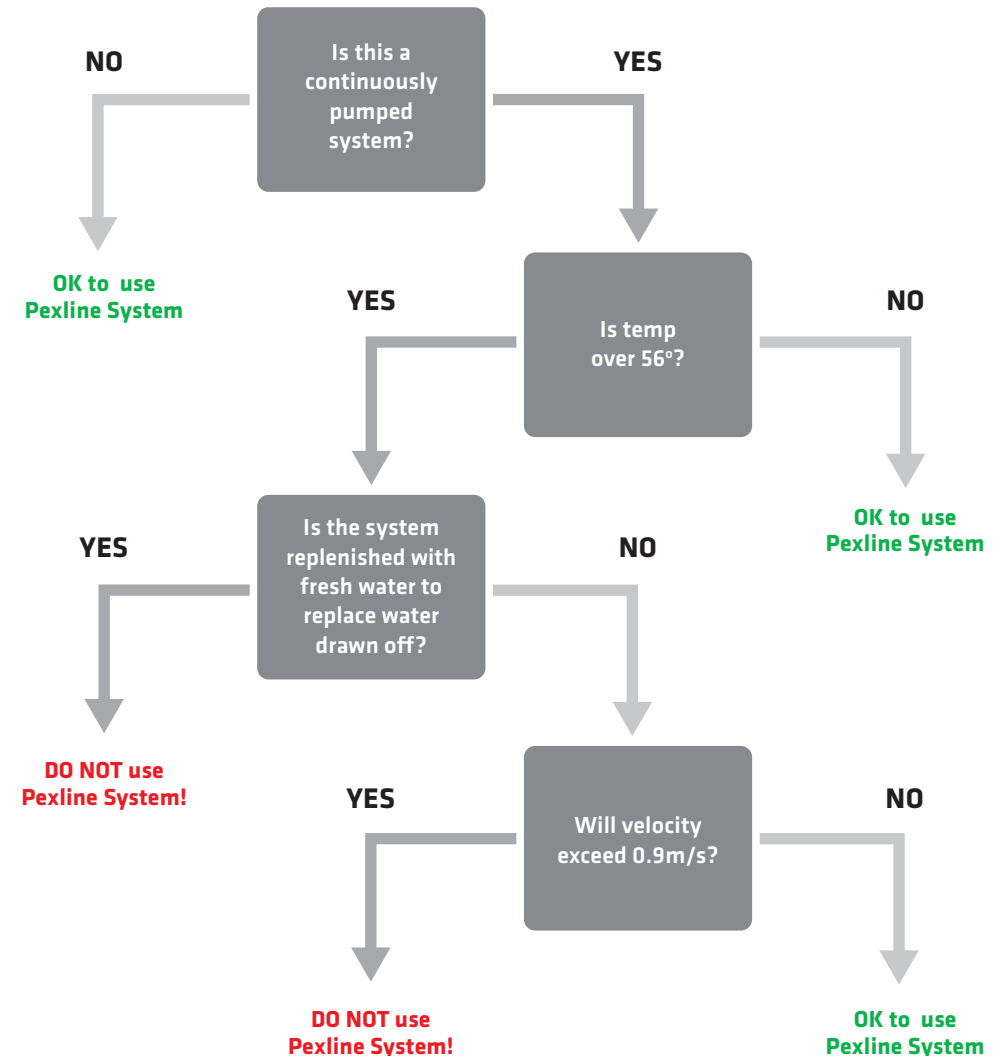
A continuously operated re-circulating system is a hot water supply system which provides hot water to outlets and incorporates all three of the following:

- Is maintained at a temperature above 60°C.
- Is replenished with an incoming water supply to replace the water drawn to outlets.
- Is a pumped, circulating system.

Continuously operated re-circulating 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 either AS/NZS 2492 and AS/NZS 2537 or WaterMark approval standards, and for this reason these products must not be used on any continuously operated re-circulating systems as they are not approved under the current version of these standards. Manufacturers' own technical information should always be consulted as specific product limitations may apply.

Is Pexline Suitable for use with Re-circulated Hot Water Systems?*

**Buteline NZ Ltd will not advise installers on the suitability of their specific system, simply follow the flow chart below to gain your conclusion.*



Non-Potable Water Piping

Lilac coloured PE-X pipe as per AS/NZS 2492 is to be used for non-potable water supplies, not suitable for human consumption such as grey water, reclaimed water and stormwater retention tank applications.

Non-potable water typically supplies WC, laundry, and less frequently, outdoor hose taps. Check with your local authorities for correct applications.



Other Uses for the Pexline Plumbing System

If you wish to use the Pexline System outside of a normal potable water system (e.g. compressed air lines), please check with a Buteline technical representative for appropriate recommendations and installation instructions on 0800 BUTELINE before you proceed to install.

Installation Checklist

- ✓ Be methodical and check as you go that each joint has been clamped correctly.
- ✓ Check the pipe is clean and in good condition, with no kinks or scores.
- ✓ Check that pipework is “clipped” and supported.
- ✓ Check for expansion and contraction allowance on pipes.

Test The Installation

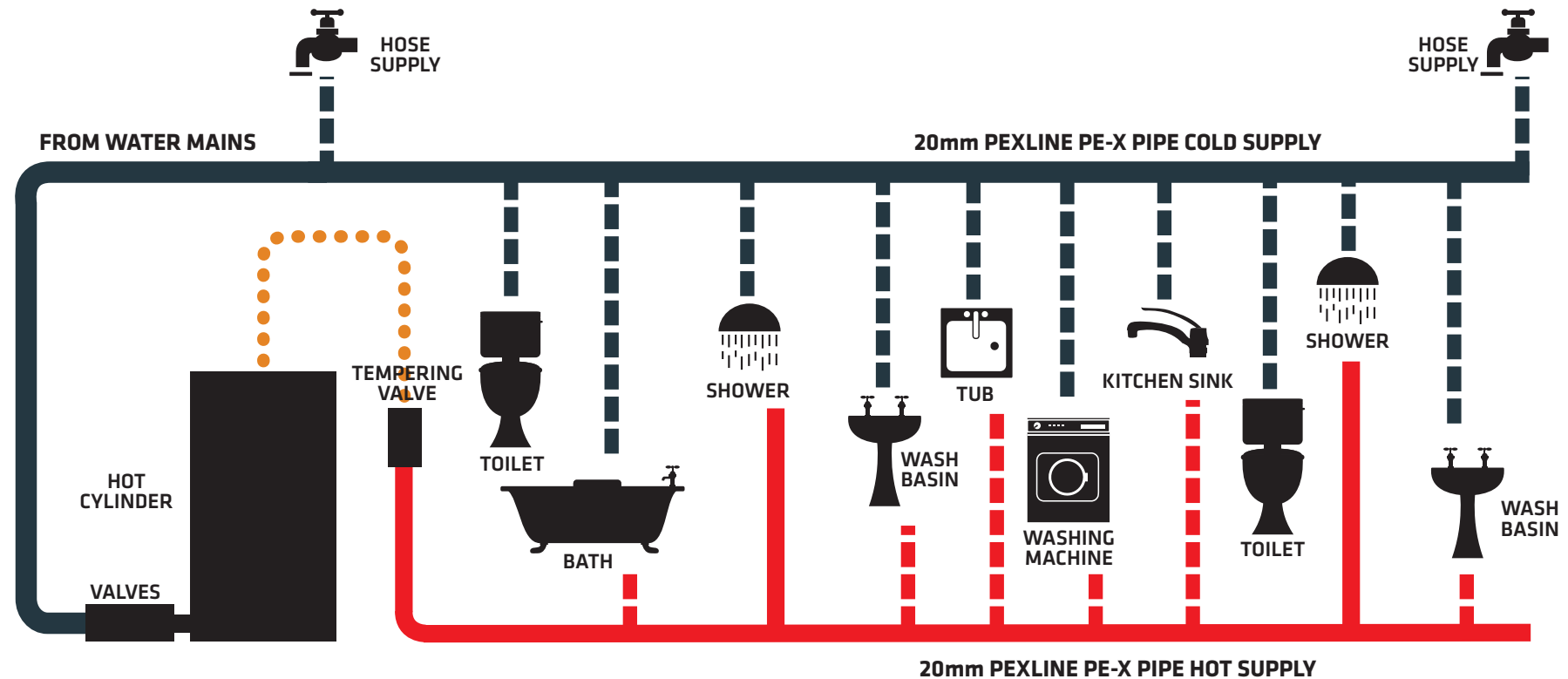
As with all installations, the Pexline Plumbing System should be tested immediately after installation. Installations should be tested COLD.

- (a) 1500 kPa (220 P.S.I.) for 30 minutes (NZ Building Code & AS/NZS 3500.1) or 1035 kPa (150 P.S.I.) for 12 hours or overnight.
- (b) Set the hot water thermostat to a maximum of 60°C and check the hot water temperature (commissioning stage).



Typical Method Of Plumbing

Using Pexline PE-X Water Mains As Shown



- 20mm PEXLINE PE-X PIPE
- 20mm PEXLINE PE-X PIPE
- 16mm PEXLINE PE-X PIPE
- 16mm PEXLINE PE-X PIPE
- COPPER PIPE

Definition Of Terms

Boiling Point

The boiling point refers to the temperature at which a liquid changes to vapour by the addition of heat.

The boiling point depends on the pressure at which the liquid is held.

Boiling point increases as the pressure increases.

Clamp

To brace, clasp or band for strengthening other materials. To strengthen or fasten to hold firmly. (Dictionary definition)

Crimp

To press into pleats or folds. (Dictionary definition)

Convection

Refers to the transfer of heat by means of a flow of fluid (liquid or gaseous form). Liquid is heated in one place then moved to a place where it can give up its heat. Natural convection is caused by heating a fluid making it less dense than the surrounding fluid and allowing the heated fluid to rise by displacement.

Crox Nut (NZ)

Use of a tapered copper section or olive with a lock seal nut.

Dezincification

When exposed to water many brasses show deterioration in which the zinc content is gradually removed – leaving a “spongy” copper which can become porous and leak. Some waters produce this effect very rapidly.

Underground Installation

Any installation where the product can come into direct contact with minerals, soil, or corrosive substances.

Marine Installation

Any installation where the product is prone to salt water exposure.

Design Stress Pressure

A design stress pressure is a factor used to calculate test pressure or safe working pressure.

A formula is used which incorporates wall thickness, pipe diameter and material characteristics to determine acceptable pressures.

i.e. PE-X design stress 930 P.S.I. = Test pressure 280 P.S.I. on DN 16 PN 16 Pipe. Refer to Pressure Conversion Chart (page 44).

Limiting Valve

A pressure limiting valve. A form of pressure reducing valve which automatically reduces inlet water pressure to acceptable limits at the outlet – but only when supply pressure exceeds the pre-set minimum.

Potable

Drinkable water.

Tempering Valve

A valve which modifies hot water by adding cold water to produce water at a constant pre-set temperature.

T.P.R. (Temperature/Pressure Relief)

A fixed setting combination valve for temperature and pressure relief.

“Wet Back” (NZ)

“Back boiler”. Water coils behind a domestic fire or cooking range. Any fuel fired unit fitted with a coil or tank system which permits water to heat and flow by convection to a storage cylinder.

Pressure Conversion Chart

kPa	Bar	Metre Head	P.S.I.
5	0.05	0.5	0.72
10	0.1	1	1.45
20	0.2	2	2.90
30	0.3	3	4.35
40	0.4	4	5.80
50	0.5	5	7.25
60	0.6	6	8.70
70	0.7	7	10.15
80	0.8	8	11.60
90	0.9	9	13.05
100	1.0	10	14.50
200	2.0	20	29.00
300	3.0	30	43.50
400	4.0	40	58.00
500	5.0	50	72.50
1000	10.0	100	145.00

(Rounded)

- 1 metre head = 3.28ft head
 - Additional conversions can be calculated.
- e.g. To find 700 kPa in bars or metre head from chart
- 500 kPa = 5 bar or 50 metre head
 + 200 kPa = 2 bar or 20 metre head
 = 700 kPa = 7 bar or 70 metre head

The Pexline 25 Year Guarantee

To whom it may concern,

Pexline warrants all of our pipes and fittings for 25 years from the date of manufacture against defects in manufacturing, provided the installation is carried out by a licensed plumber and in accordance with the latest version available at the date of installation of our Plumbers Technical & Installation Manual and complies with local and national plumbing regulations.

The Pexline Plumbing System meets the requirements of the NZ Building Code Durability Clause and meets the approved document G12 Water Supplies Acceptable Solutions (pages 21 and 23) through meeting Australia/ New Zealand joint standards AS/NZS 2492 and AS/NZS 2537.

It should be stated therefore that when the Pexline Plumbing System is installed to meet all the requirements of approved document G12 (Building Code first published July 1992) and the Pexline Plumbers Manual, the system (pipes and fittings) is guaranteed by Buteline NZ Ltd.

It should be noted that G12 "Acceptable Solutions" demands the use of a suitable tempering valve for all hot water systems to be utilised for personal hygiene.

This warranty is not applicable where installation is not according to relevant installation standard and instructions, product design or if the product defect is due to incompatible or unsuitable environment or incorrect specification.

Disclaimer

This manual is only a general guide to the Pexline Plumbing System and cannot take into account the different circumstances of every application. The information contained in this manual is provided without any express, statutory or implied warranties. Neither the authors, Buteline, nor its partners or subsidiaries will be held liable for any damages caused or alleged to be caused either directly or indirectly by this manual.

This manual is subject to amendment by Buteline NZ Ltd and the latest available version is available from <https://www.pexline.com>. The users of this manual should ensure that their copy is the latest version available before proceeding with any installation. Installation of Pexline components in accordance with an older version of the manual may invalidate any guarantee provided by Buteline NZ Ltd.

Buteline NZ Limited

29 Lady Ruby Drive, East Tamaki, Auckland, New Zealand

PO Box 204308, Highbrook, Auckland 2161, New Zealand

Phone: +64 [0] 9 273 5800

Email: sales@buteline.co.nz

www.buteline.com

www.pexline.com

