

# **BUTE-FEXLINE**

PLUMBING SYSTEM

## Plumbers Technical & Installation Manual



**SureFit**  
**EasyID**

**0800 BUTELINE**  
**[www.pexline.com](http://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 & 32mm Range	5
Pexline Fittings	10
Pexline PE-X Pipe	11
Pexline Clamp Tools	12
Installation Demo for Pexline ProClamp Tools, 25mm & 32mm Clamp Tool	13
Adjustment Instructions for Pexline ProClamp Tools	14
Adjustment Instructions for 25mm & 32mm Clamp Tools	15
Installation Guide	16
Use Only the Complete Pexline System	19
Storage and Handling	20
Feeding Pexline PE-X Pipe Through Timbers	21
Bending Radius	22
Pipe Clipping	23
Pexline Threaded Connections & Swivel Connections	24
Connecting PE-X to Copper (Brazing Tails)	25
Connecting PE-X to PB & Connecting PN16 PE-X to PN20 PE-X	27
Installing Pexline Underground	28
Installing Pexline in Concrete / Masonry / Marine	29
Chlorine Environments	30
Freezing Conditions & UV Exposure	31
Fire Protection	32
Passive Fire Protection Guide	33
Working Pressure	34
Pipe Pressure Head Loss for PE-X Pipe	35
Hot Water Installations	35
Typical High Pressure Hot Water Cylinder	36
Typical Low Pressure Hot Water Cylinder	37
Solar Hot Water & Recirculated Hot Water Systems	38
Is Pexline Suitable for use with Re-circulated Hot Water Systems?	39
Non-Potable Water Piping & Other Uses for Pexline	40
Installation Checklist	41
Typical Method of Plumbing	42
Definition of Terms	44
Pressure Conversion Chart	46
The Pexline Warranty	47

## 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.

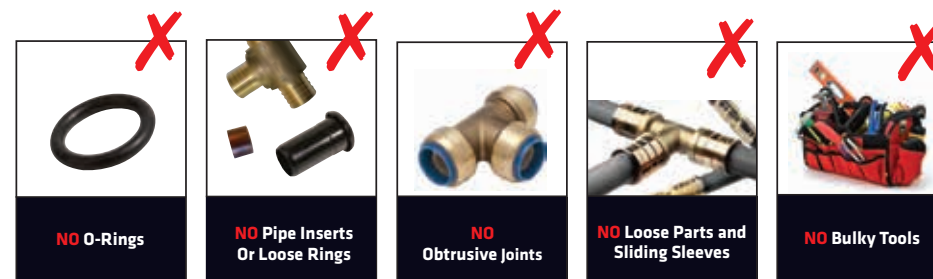
It is strongly recommended that tradesmen use the total Pexline system, i.e. Pexline clamp tools, Pexline PE-X pipes and clips, and Pexline fittings, to ensure total compatibility of installations.

When installed in accordance with recommendations contained herein, the complete system is fully guaranteed by Buteline (see page 47).



## Why Choose The Pexline Plumbing System

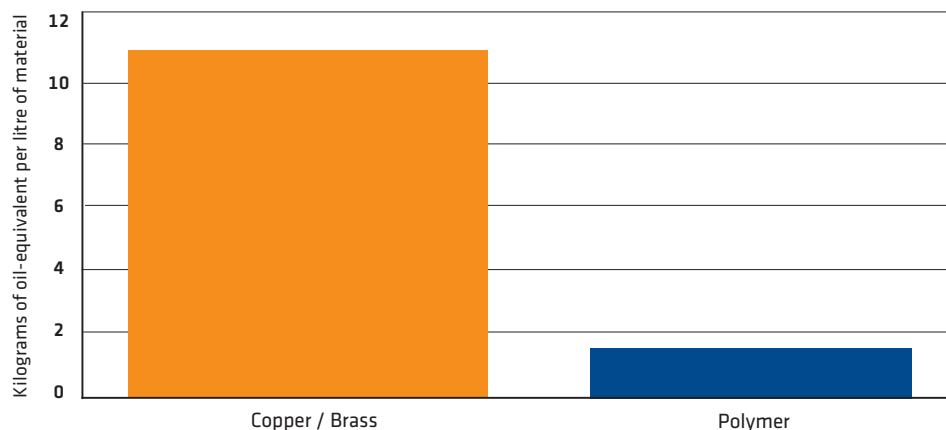
- ✓ The Pexline System is designed in New Zealand, with the polymer fittings being made in New Zealand, and other quality components being sourced from verified overseas suppliers to supplement the system.
- ✓ The Pexline System has been designed specifically for use by tradesmen, and meets the requirements 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 & 32mm Range

**NEW!**



### EQUAL TEES

PT16 - 16mm x 16mm x 16mm  
PT20 - 20mm x 20mm x 20mm  
PT25 - 25mm x 25mm x 25mm  
PT32 - 32mm x 32mm x 32mm



### 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

**NEW!**



### 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  
PTR332 - 32mm x 32mm 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

**NEW!**



### BRASS FEMALE SWIVELS

PF16B - 1/2" BSP x 16mm  
PF20B - 3/4" BSP x 20mm  
PF32B - 1 1/4" BSP x 32mm

### BRASS REDUCING FEMALE SWIVEL

PF2016B - 3/4" BSP x 16mm

**NEW!**



### BRASS FIXED / FEMALE SWIVEL STRAIGHT

FF52 - Fixed 3/4" BSP  
x 3/4" BSP Female

**NEW!**



### BRASS MALE / FEMALE SWIVEL STRAIGHT

MF52 - Male 3/4" BSP  
x 3/4" BSP Female



### FIXED FEMALE SWIVEL

PFF20B - 3/4" BSP x 20mm

## Pexline Plumbing System

**NEW!**


### INLINE COUPLINGS

PS16 - 16mm x 16mm  
PS20 - 20mm x 20mm  
PS25 - 25mm x 25mm  
PS32 - 32mm x 32mm

**NEW!**


### REDUCING COUPLINGS

PS2016 - 20mm x 16mm  
PS2520 - 25mm x 20mm  
PS3220 - 32mm x 20mm  
PS3225 - 32mm x 25mm

**NEW!**


### 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  
PM32B - 1 1/4" BSP x 32mm

**NEW!**


### BRASS LUGGED MALE ADAPTOR

PML16B - 1/2" BSP x 16mm



### 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

**NEW!**


### EQUAL ELBOWS

PE16 - 16mm x 16mm  
PE20 - 20mm x 20mm  
PE25 - 25mm x 25mm  
PE32 - 32mm x 32mm

**NEW!**


### 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

### REDUCING ELBOW

PE2016 - 20mm x 16mm

## 16mm, 20mm, 25mm & 32mm Range

**NEW!**


### 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



### 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

PWMT216 - 1/2" BSP x 16mm x 200mm  
PWMT220 - 3/4" BSP x 20mm x 200mm

**NEW!**


### PRO PLUG

PP1520 - 1/2" BSP & 3/4" BSP



## Pexline Plumbing System



### PIPE END PLUGS

PPC16 - 16mm  
PPG20 - 20mm  
PPG25 - 25mm



### MASONRY NAIL PIPE CLIPS

PBA16 - 16mm  
PBA20 - 20mm  
PBA25 - 25mm  
PBA32 - 32mm

### 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  
PXL32 - 32mm x 5m Lengths



### PEXLINE PIPE

For Hot Water

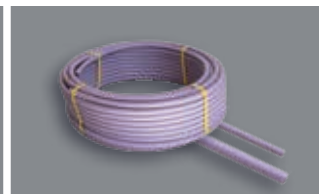
PCH16 - 16mm x 50m Coil  
PCH20 - 20mm x 50m Coil  
PLH16 - 16mm x 5m Lengths  
PLH20 - 20mm x 5m Lengths



### 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



### PEXLINE PIPE

For Grey Water / Recycled Water

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

## 16mm, 20mm, 25mm & 32mm Range



### 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  
FRX32 - 32mm  
Includes checking gauge.



### ELECTRIC CLAMP TOOL & JAWS

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

PET02 - As PET01 above, with 32mm jaw.

PETJ16 - 16mm jaws  
PETJ20 - 20mm jaws  
PETJ25 - 25mm jaws  
PETJ32 - 32mm jaws

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



### PIPE CUTTERS

PC30 (Yellow plastic)  
PC32 (Yellow metal) - 32mm  
PC32-B1 - Replacement blade for PC32.



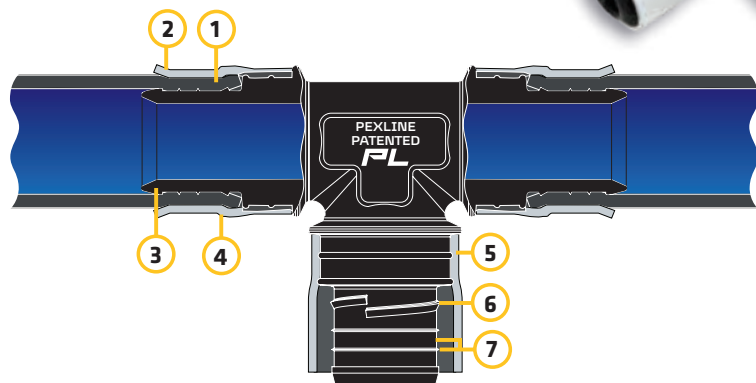
### PEXLINE FITTINGS CASES

PEXFC - A quality fittings case with a selection of Pexline fittings.  
PEXC - This tough and durable 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

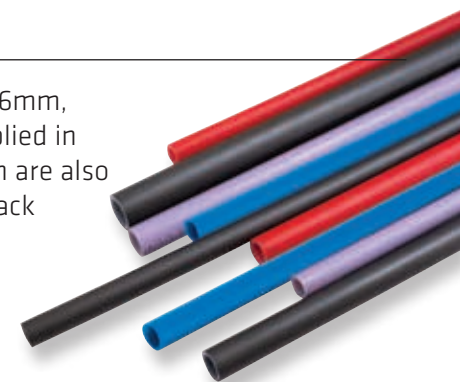
Pexline pipe is PN16 PE-Xb pipe and produced in 16mm, 20mm, 25mm and 32mm. All four sizes are supplied in 5m straight lengths, and 16mm, 20mm & 25mm are also supplied in 50m coils. 16mm & 20mm carbon black PE-X pipe are also available as 100m coils.

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 34).



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 four sizes to suit 16mm, 20mm, 25mm and 32mm Pexline fittings.



PE-X Clamp Tool  
25mm & 32mm

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 & 32mm 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 14 & 15) 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 & 32mm 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.

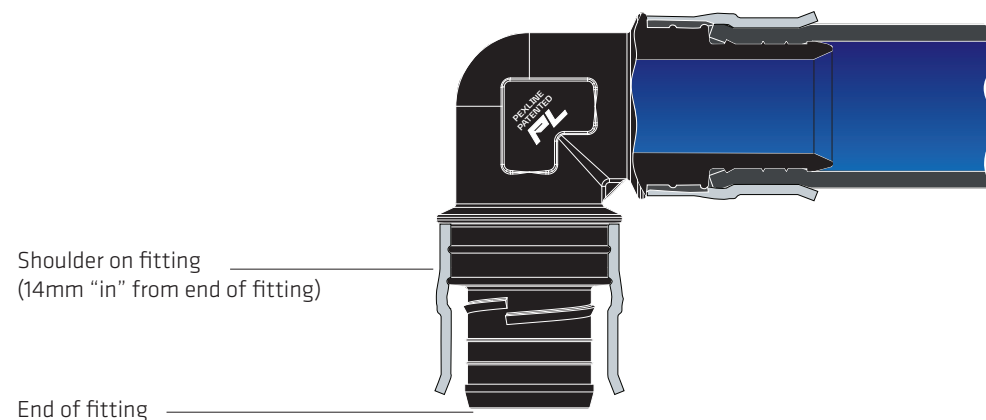
### Preparation Of PE-X Pipe

- (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.

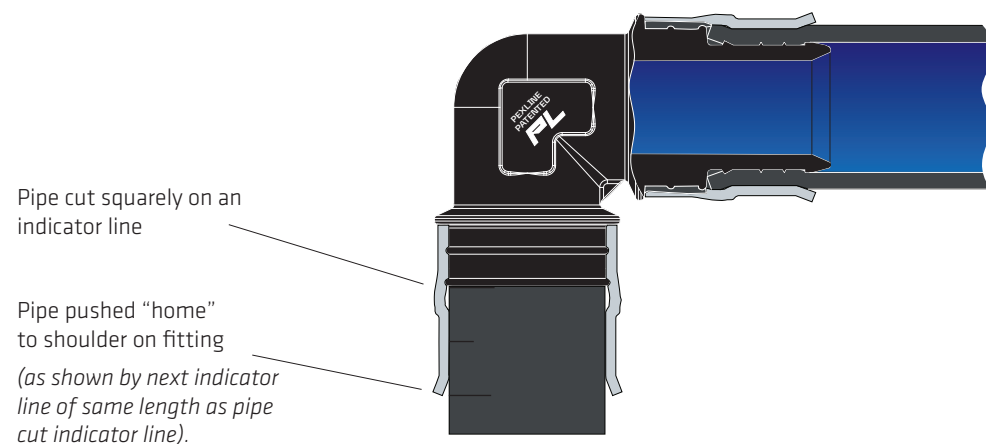


### Position Of Fittings

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



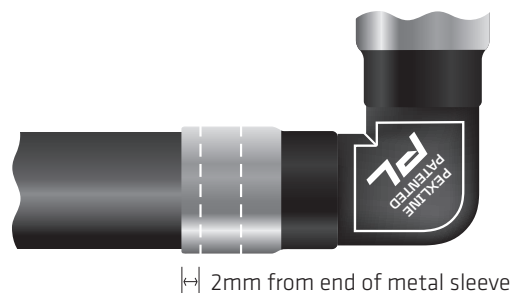
- (b) Fully insert (push home to shoulder) with a slight twist to SureFit the PE-X pipe into Pexline fittings, up to the next visible indicator line of the same size to ensure full engagement of pipe into the fitting.



## Clamping Pexline Fittings

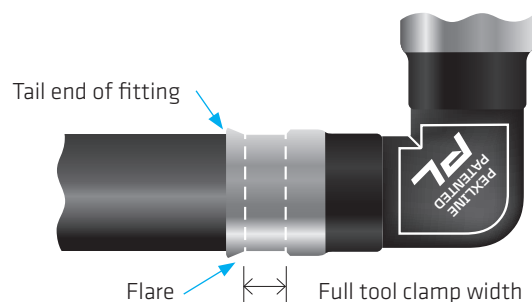
- (a) Position the Pexline clamp tool squarely and approximately 2mm in from the end of the factory fitted reinforcing clamp ring.

**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  
 Use 40mm drills for – 32mm pipe

- (b) Larger holes may be required to ease pipe through if changing direction.
- (c) Use of silicone in the holes is not required.

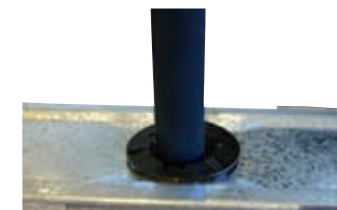


### NOTE:

*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
32mm (O.D. 32mm)	260mm



## 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
32mm	0.85m	1.7m

## 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 / 32mm 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 28).

## 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 28).



## 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.

**INSTALLER NOTE:** *In locations with known problems of fitting/pipe corrosion or where the water is or is suspected to be highly corrosive, eg: in volcanic areas, in installations using bore/well water or in applications using water with high chlorine content which may fluctuate higher than the World Health Organization (WHO) levels, there is a danger that fittings/pipe may corrode/degenerate. The suitability and warranty coverage of the Pexline Plumbing System in such installations require a prior independent consultation with Pexline to validate if fit for purpose in the designated environment. In some cases, the accessible or nearby water quality may also void the Pexline warranty unless appropriate water treatment is provided in consultation with Pexline. The responsibility is that of the installer to verify -- if unsure please seek professional advice by consulting your local water authority and/or the 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.

*Passive fire protection is available from Ryanfire ([www.ryanfire.co.nz](http://www.ryanfire.co.nz)) and fire collars are available from Allproof Industries ([www.allproof.co.nz](http://www.allproof.co.nz)), please contact them for more information.*

## Passive Fire Protection Guide



### V22.9



#### 16mm FR PLASTERBOARD CEILINGS

Up to Ø32mm Bute Pexline pipe  
40mm Ryanfire SL Collar &  
Ryanfire HP-X

Ø16mm -/60/60      Ø32mm -/30/30

### V20.6



#### 13mm FR PLASTERBOARD WALLS

Up to Ø32mm Bute Pexline pipe  
Intubatt & Intumastic HP

-/60/60

### V25.9



#### 100mm CONCRETE FLOORS

Up to Ø32mm Bute Pexline pipe  
40mm Ryanfire TD Collar  
& Ryanfire Mastic

Ø16mm -/120/90      Ø32mm -/120/-

### V24.2



#### 120mm CONCRETE FLOORS

Up to Ø32mm Bute Pexline pipe  
Intubatt & Intumastic HP

-/120/120

### V21.3



#### 13mm FR PLASTERBOARD WALLS

Up to Ø32mm Bute Pexline pipe  
40mm Ryanfire SL Collar &  
Ryanfire HP-X

-/60/30

### V20.1

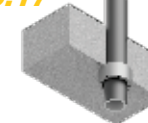


#### 26mm FR PLASTERBOARD WALLS

Up to Ø32mm Bute Pexline pipe  
Intumastic HP

-/120/120

### V25.17



#### 100mm CONCRETE FLOORS

Up to Ø32mm Bute Pexline pipe  
Ryanfire SL Collar  
& Ryanfire HP-X

Ø16mm -/120/90      Ø32mm -/30/-

### V23.2



#### 130mm COMPOSITE FLOORS

Up to Ø32mm Bute Pexline pipe  
Mixed Service Penetration  
Intubatt, Intustrap  
& Intumastic HP

-/90/-

### V25.16



#### 120mm COMPOSITE FLOORS

Up to Ø32mm Bute Pexline pipe  
Ryanfire TD Collar  
& Ryanfire Mastic

Ø16mm -/120/60      Ø32mm -/60/30

### V21.4



#### 13mm FR PLASTERBOARD WALLS

Up to Ø16mm Bute Pexline pipe  
40mm Ryanfire SL Collar &  
Ryanfire HP-X

-/60/30

### V20.3



#### 13mm FR PLASTERBOARD WALLS

Up to Ø32mm Bute Pexline pipe  
Plasterboard patch  
Intumastic HP

-/60/-

### V22.6



#### 100mm CONCRETE FLOORS

Up to Ø32mm Bute Pexline pipe  
Intumastic HP

-/120/120

### V22.5



#### 100mm TIMBER INFILL FLOORS

Up to Ø32mm Bute Pexline pipe  
Mixed Service Penetration  
Intubatt, Ryanfire SL Collar  
& Intumastic HP

-/60/-

\*Please note the seal information is for the maximum pipe diameters.  
Actual seal fire performance & approvals may exceed what is shown.  
Please contact Ryanfire for details and specific fire performance information.

**All seals tested to AS1530.4**

Tel 09 443 0362      info@ryanfire.co.nz  
www.ryanfire.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	
	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		32mm	
Litres	Gallons	kPa	P.S.I.	kPa	P.S.I.	kPa	P.S.I.	kPa	P.S.I.
18.0	4	180	26.1	20	2.9	15	2.18	5	0.73
22.5	5	240	34.8	90	13.05	23	3.34	7	1.00
27.0	6	420	60.9	120	17.4	32	4.65	10	1.45
31.5	7	540	78.3	180	26.1	43	6.24	13	1.90
36.0	8	750	109	210	30.5	55	8.0	17	2.50
40.0	9	900	130.5	270	39.2	67	9.7	20	2.90
45.0	10	1200	174	360	52.2	83	12.0	26	3.80

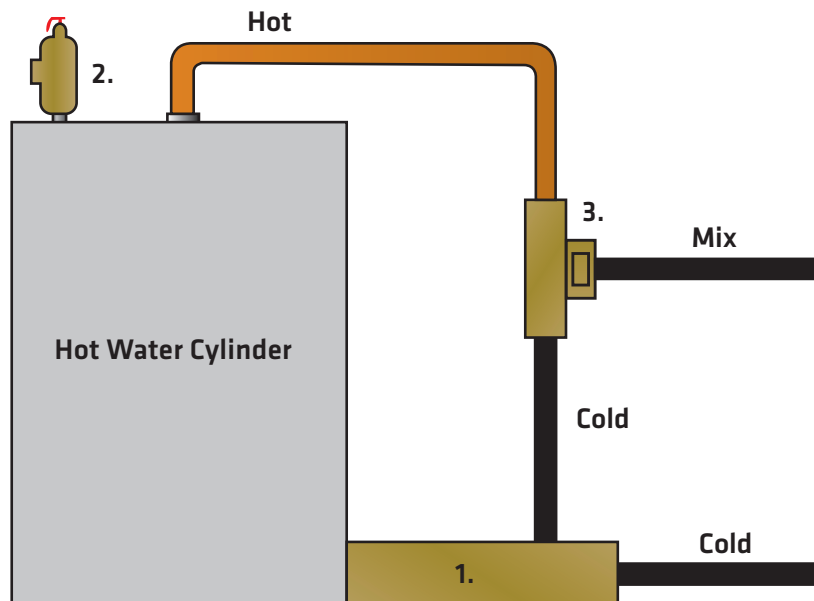
Please refer to page 46 for a Pressure Conversion Chart.

## 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



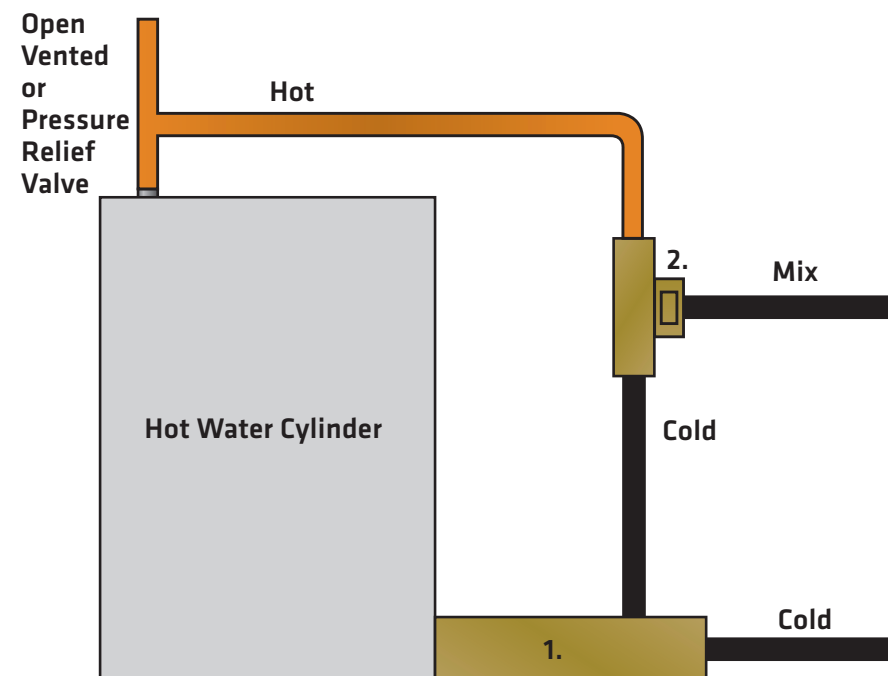
**Pexline PE-X Pipe**  
**Copper Pipe** (minimum 1m)



- 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

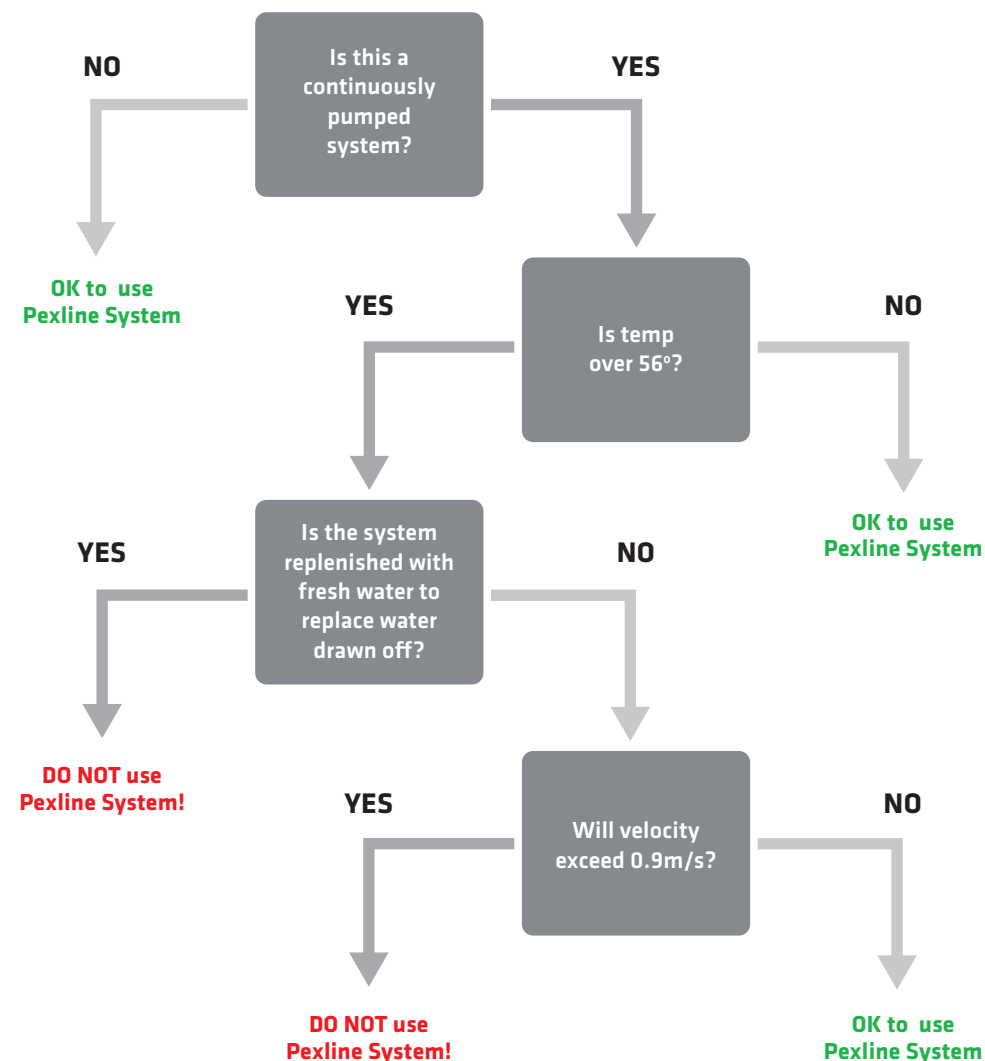
A continuously operated re-circulating system is a hot water supply system which provides hot water to outlets and incorporates all three of the following:

- 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.

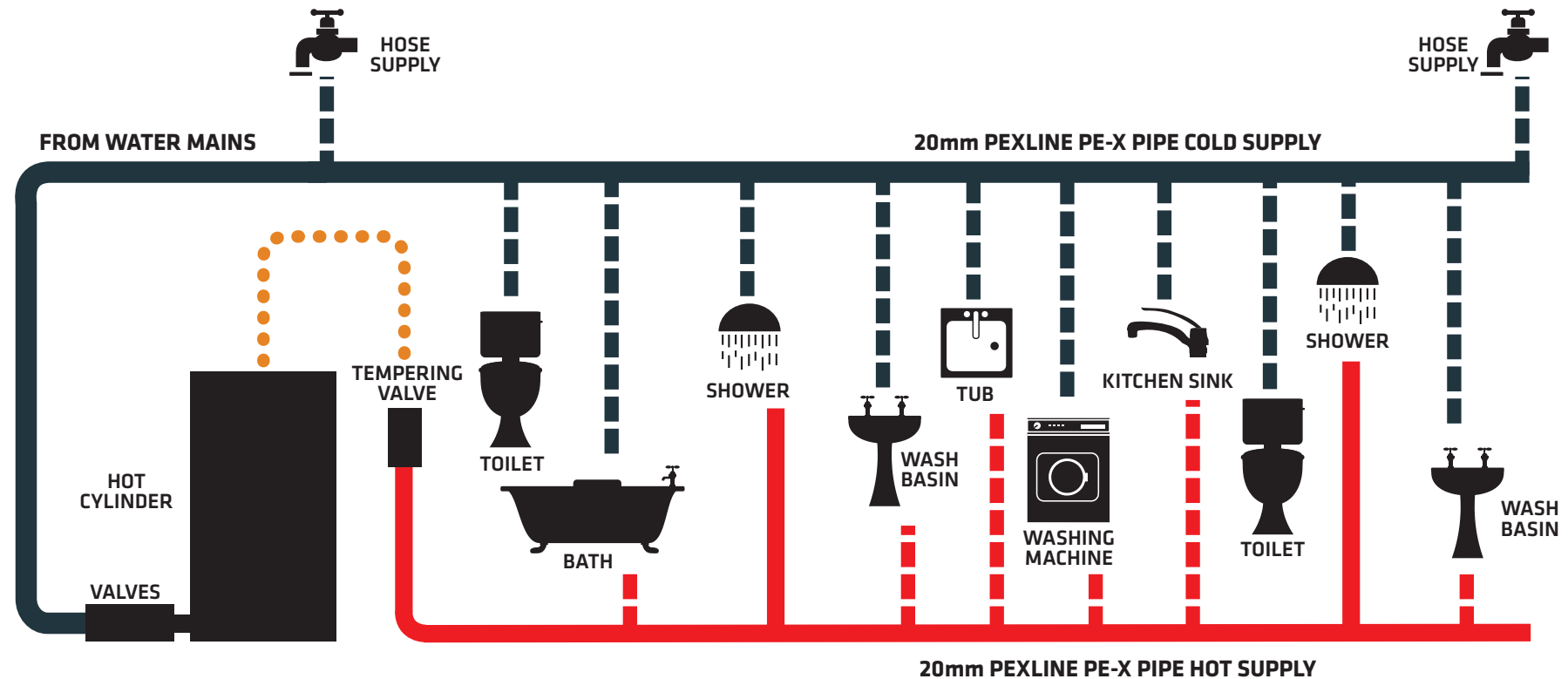
## Test The Installation

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 46).

### 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 Warranty

### To whom it may concern,

Buteline NZ Ltd ("Buteline") warrants that all products within the Pexline Plumbing System (including pipes and fittings) ("Pexline System") will be free from manufacturing defects for a period of 25 years from the date of manufacture ("Warranty") and that the Pexline System meets:

- The durability requirements of the New Zealand Building Code;
- The Australia/New Zealand joint standards AS/NZS 2492 and AS/NZS 2537; and
- The standards set out in the Acceptable Solutions and Verification Methods G12 Water Supplies document (3rd edition, amendment 12) prepared by the Ministry of Business, Innovation & Employment.

### This Warranty is strictly subject to the following terms and conditions.

**Installation Requirements:** Installation of the Pexline System must be carried out:

- By a licensed plumber;
- Strictly in accordance with the latest version available at the date of installation, of Pexline's Plumbers Technical & Installation Manual, which may be found at [www.buteline.com/nz/pexline](http://www.buteline.com/nz/pexline);
- In compliance with local and national plumbing regulations; and
- In accordance with the Acceptable Solutions and Verification Methods G12 Water Supplies document (3rd edition, amendment 12) prepared by the Ministry of Business, Innovation & Employment, including the requirement to use a suitable tempering valve for all hot water systems to be utilised for personal hygiene.

**Exclusions:** This Warranty does not apply if:

- The Installation Requirements set out above have not been met;
- The Pexline System has not been installed in a proper and workmanlike manner to the highest possible standard expected of a licensed plumber;
- The Pexline System has been installed in an incompatible or unsuitable environment where it is not fit for purpose, including if any system design is unsuitable;
- The Pexline System has not been used or maintained in accordance with Buteline's instructions;
- The Pexline System has been modified, incorrectly adjusted or operated; or
- The Pexline System has been subjected to corrosive or foreign solutions or chemicals (including highly chlorinated water that does not meet the standards set by the World Health Organisation) either internally within or externally around the Pexline System.

**Consumer Guarantees Act:** This Warranty is in addition to and does not exclude or limit a consumer's rights in relation to the Pexline System or its installation under the Consumer Guarantees Act 1993 (New Zealand).

**Limitations:** This Warranty is subject to the following limitations:

- Buteline's liability under this Warranty is limited to the cost of repairing or replacing the defective products within the Pexline System (at Buteline's discretion).
- Buteline will not be liable for the cost of any inspection, return, removal or reinstallation of any defective products or labour or other costs which may arise as a result of any claim under this Warranty.
- The Warranty only applies to pipes, fittings and joints within the Pexline System and does not extend to any other pipe, fitting or joint not made by Pexline or Buteline.
- Any claim under this Warranty must be made within 30 days of any potential claim being identified.
- Buteline does not in any way warrant the workmanship of any party that installs the Pexline System, nor does it warrant the system design incorporating the Pexline System by any party.
- This Warranty is only valid for products sold and installed in New Zealand, Asia and the Pacific.

**Claims:** To claim under this Warranty:

- Please contact Buteline at the following address: [warranty@pexline.co.nz](mailto:warranty@pexline.co.nz) and send us the invoice for the products (as proof of purchase) and the installer's details, including their plumbing licence number.
- A Buteline representative will be in contact within 48 hours of receipt of your claim.
- Any products that are the subject of a claim cannot be destroyed or removed from the installation site until we have inspected the same or waived our right to do so in writing.

### 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](mailto:sales@buteline.co.nz)

[www.buteline.com](http://www.buteline.com)

[www.pexline.com](http://www.pexline.com)

