

# **BUTELINE**<sup>TM</sup> PLUMBING SYSTEM

## Plumbers Technical & Installation Manual

The Complete Plumbing System



**0800 BUTELINE**  
[www.buteline.com](http://www.buteline.com)

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## Buteline And Its Commitment

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The Buteline Professional Polybutene-I (PB-I) Plumbing System has won world acclaim for innovation and advanced design. To this day, Buteline's commitment to excellence continues to be evident with every product shipped from its manufacturing facility in Auckland, New Zealand.

Buteline is proud to be a New Zealand owned and operated company that supports local manufacturing and design. Buteline supports the 'Buy NZ Made' campaign and, as a manufacturer, is able to supply to meet local demand while closely monitoring and testing product quality.

Buteline has installed in-house test equipment to give both quality assurance and quality control of production. These facilities combined with a strong commitment to continuing research and development will ensure that Buteline remain leaders in PB-I plumbing technology. Our engineers and technical team thrive on the challenges presented with future product development.

The Buteline Plumbing System complies with the Australian and New Zealand joint standards AS/NZS 2642 and AS/NZS 4130, and is covered by extensive worldwide patents.



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

## The Buteline Plumbing System

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Buteline has developed a total solution to the need for a safe, integrated and easy to use potable water plumbing system. The resultant PB-I system is designed specifically for professional plumbers and has proven to be high quality and economical.

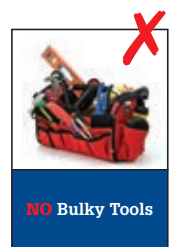
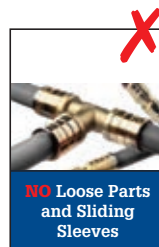
It is strongly recommended that tradesmen use Buteline's total system, i.e. Buteline clamp tools, Buteline PB-I pipe and clips, and Buteline fittings, to ensure total compatibility of installations.

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



## Why Plumbers Use The Buteline Plumbing System

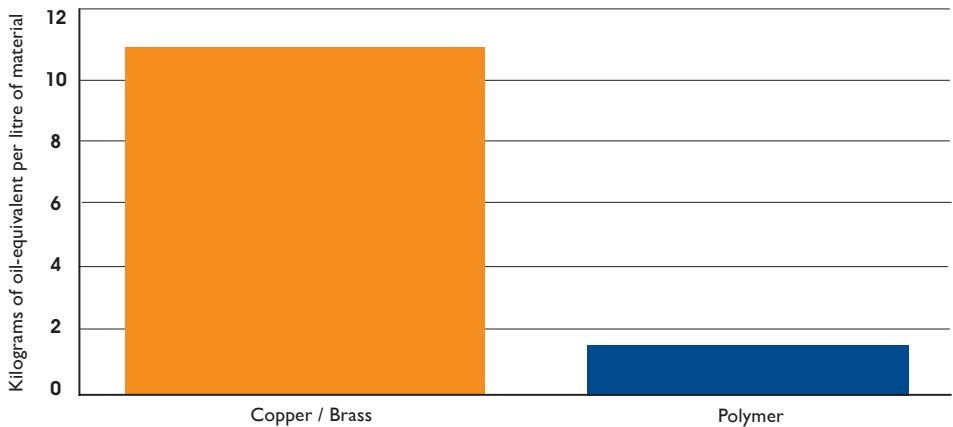
- ✓ The Buteline PB-I System is made in New Zealand and is readily available from leading Plumbing Merchants.
- ✓ The Buteline PB-I System has been designed specifically for use by tradesmen, and meets the requirements of AS/NZS 2642.
- ✓ The Buteline Plumbing System can be installed with no connection to metals using our unique range of polymer fitting solutions.
- ✓ Buteline fittings have a one-piece design concept, incorporating factory fitted clamp rings which ensures high productivity, while providing the strongest reinforced joint available.
- ✓ Buteline fittings are light-weight and easy to transport, with no additional parts such as o-rings, grab rings and pipe inserts.
- ✓ Buteline pipe is one of the most flexible in the market, eliminating water hammer noise. In addition, pipe flexibility = less fittings required.
- ✓ Buteline clamp tools have been designed and engineered for ease of use, to give long life and a professional result every time.
- ✓ The team at Buteline NZ Ltd are readily available to assist you with the best customer service when and where required.



## Green, Sustainable Plumbing

- ✓ Buteline 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**



# Buteline PB-1 Plumbing System



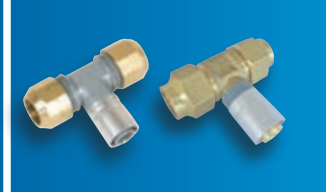
## EQUAL TEES

T15 - 15mm x 15mm x 15mm  
 T20 - 20mm x 20mm x 20mm  
 T305 - 28mm x 28mm x 28mm



## REDUCING TEES

TR112 - 15mm x 15mm x 20mm  
 TR211 - 20mm x 15mm x 15mm  
 TR212 - 20mm x 15mm x 20mm  
 TR221 - 20mm x 20mm x 15mm  
 TR334 - 28mm x 28mm x 20mm  
 TR335 - 28mm x 20mm x 20mm  
 TR336 - 28mm x 20mm x 28mm  
 TR337 - 28mm x 28mm x 15mm



## IN LINE COPPER TO PB PIPE TEE

TC15 - 1/2" BSP x 1/2" BSP x 15mm  
 to fit 15mm copper

## BRASS IN LINE COPPER TO PB PIPE TEE

TC15B - 1/2" BSP x 1/2" BSP x 15mm  
 to fit 15mm copper



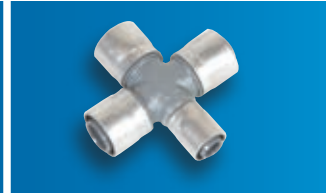
## COPPER TO PB PIPE TEE

TK15 - 15mm x 15mm x 1/2" BSPT  
 to fit 15mm copper



## EQUAL CROSSES

CX40 - All 15mm  
 CX48 - All 20mm



## REDUCING CROSSES

CX42 - 20mm x 20mm x 20mm x 15mm  
 CX44 - 20mm x 15mm x 20mm x 15mm  
 CX46 - 20mm x 15mm x 15mm x 15mm



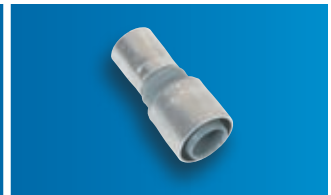
## FEMALE SWIVELS

F15 - 1/2" BSP x 15mm  
 F20 - 3/4" BSP x 20mm  
 F2015 - 3/4" BSP x 15mm  
 SF350 - 3/4" BSP x 28mm  
 SF450 - 1" BSP x 28mm



## INLINE COUPLINGS

S15 - 15mm x 15mm  
 S20 - 20mm x 20mm  
 S105 - 28mm x 28mm



## REDUCING COUPLINGS

S2015 - 20mm x 15mm  
 SR125 - 28mm x 20mm

## CHROMED FEMALE SWIVEL

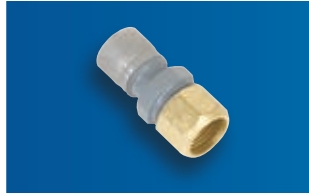
F15C - 1/2" BSP x 15mm

# Buteline PB-1 Plumbing System



## MALE ADAPTORS

M15 - 1/2" BSPT x 15mm  
 M20 - 3/4" BSPT x 20mm  
 M2015 - 3/4" BSPT x 15mm  
 SM174 - 3/4" BSPT x 28mm  
 SM175 - 1" BSPT x 28mm



## MALE ADAPTOR

M20C - 3/4" BSPT x 20mm to fit  
 20mm copper



## FEMALE BRAZING TAILS

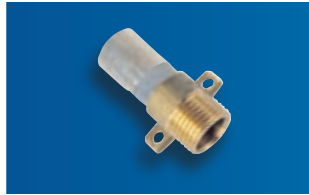
BTF15 - 15mm  
 BTF20 - 20mm

For when brazing to copper.



## BRASS MALE ADAPTORS

M15B - 1/2" BSP x 15mm  
 M20B - 3/4" BSP x 20mm



## BRASS LUGGED MALE ADAPTOR

ML15B - 1/2" BSP x 15mm



## EQUAL ELBOWS

E15 - 15mm x 15mm  
 E20 - 20mm x 20mm  
 E205 - 28mm x 28mm

## REDUCING ELBOWS

E2015 - 20mm x 15mm  
 ER224 - 28mm x 20mm



## FEMALE SWIVEL ELBOWS

FE15 - 1/2" BSP x 15mm  
 FE20 - 3/4" BSP x 20mm  
 EF351 - 3/4" BSP x 28mm  
 EF451 - 1" BSP x 28mm



## MALE ELBOWS

ME15 - 1/2" BSPT x 15mm  
 EM274 - 3/4" BSPT x 28mm  
 EM275 - 1" BSPT x 28mm



## BRASS MALE ELBOW

ME15B - 1/2" BSP x 15mm

## CHROMED FEMALE SWIVEL ELBOW

FE15C - 1/2" BSP x 15mm



# 15mm, 20mm and 28mm Range



## M&F WHITE FINISHING EXT ELBOW

BMF60 - Male 1/2" BSP x Female 1/2" BSP



## HOSE PLATES

HP15 - 1/2" BSP x 15mm  
HP22 - 3/4" BSP x 20mm



## FEMALE WING BACK ELBOWS

WE15 - 1/2" BSP x 15mm  
WE20 - 3/4" BSP x 20mm  
WE2015 - 3/4" BSP x 15mm



## TOP FIX FEMALE WING BACK ELBOWS

WET15 - 1/2" BSP x 15mm  
WET20 - 3/4" BSP x 20mm



## MALE WING BACK ELBOWS

WM15 - 1/2" BSP x 15mm x 65mm  
WM100 - 1/2" BSP x 15mm x 100mm



## TOP FIX MALE WING BACK ELBOWS

WMT215 - 1/2" BSP x 15mm x 200mm  
WMT220 - 3/4" BSP x 20mm x 200mm



## BUTE-1

Adjustable 1/2" BSP Male Wall Elbow

BUTE-1 - 1/2" BSP x 15mm x 70mm  
BUTE-1EX - 1/2" BSP x 15mm x 100mm

Includes metal braces, test caps (hot & cold) and palm spanner.



## BUTE-1 METAL FRAMING BRACKET

MFB1 - Metal framing fixing angle bracket for BUTE-1 braces.

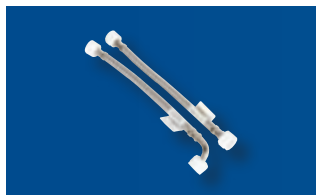
Includes metal fixing screws.



## LUGGED ELBOWS

BLE70 - 1/2" BSPT x 15mm x 70mm  
BLE100 - 1/2" BSPT x 15mm x 100mm  
Includes test cap and spanner.

# Buteline PB-1 Plumbing System



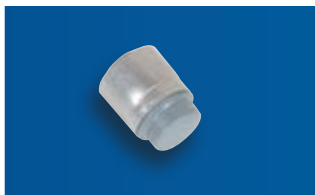
## FLEXI HOSES

1/2" BSP x 1/2" BSP x 300mm  
 FPE300 - Elbow Flexi Hose, Bute Nuts  
 FPS300 - Straight Flexi Hose, Bute Nuts



## EXTENDED TEST PLUG

BP15 - 1/2" BSP Test Plug with self sealing drain cap



## PIPE END PLUGS

PG15 - 15mm  
 PG20 - 20mm  
 PEP405 - 28mm

## TEST PLUG

PH15 - 1/2" BSPT



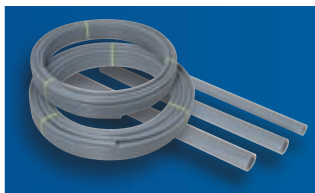
## NAIL / METAL SCREW PIPE CLIPS

<b>Nail</b>	<b>Metal Screw</b>
BA18 - 18mm	BAS18 - 18mm
BA22 - 22mm	BAS22 - 22mm
BA28 - 28mm	BAS28 - 28mm



## PIPE CLIPS FOR HOT WATER LINE

BAR18 - 18mm  
 BAR22 - 22mm



## PB-1 PIPE

BC18 - 18mm x 50m Coil  
 BC22 - 22mm x 50m Coil  
 BL18 - 18mm x 5m Length  
 BL22 - 22mm x 5m Length  
 BL28 - 28mm x 5m Length



## STRAIGHT PIPE COILS

BSC18 - 5 x 18mm x 10m Lengths  
 BSC22 - 5 x 22mm x 10m Lengths  
 Coming soon in 2015



## GREY WATER / RECYCLED WATER PIPE

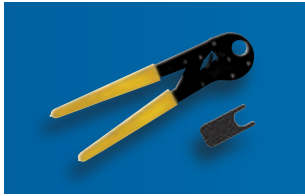
BCR18 - 18mm x 50m Coil  
 BCR22 - 22mm x 50m Coil  
 BLR18 - 18mm x 5m Length  
 BLR22 - 22mm x 5m Length



## CLAMP TOOLS

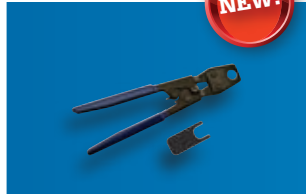
FR20 - 15mm  
 FR25 - 20mm  
 FR28 - 28mm

# 15mm, 20mm and 28mm Range



## PROCLAMP TOOLS

PRO18 - 15mm  
 PRO22 - 20mm  
 Includes checking gauge.



## QUIKCLAMP TOOL

QC20 - 15mm  
 Includes checking gauge.



## RATCHET CUTTER

PC25 (Red)

## PIPE CUTTERS

PC30 (Yellow)  
 PC31 (Orange) - Blades can be replaced.  
 PC31-BT100 - Blades for PC31.



## BUTE TOOL BELT

BTB10 - Designed to fit your Bute ProClamp tools, Bute fittings, tape measure, hammer, pencil and ruler.



## BUTE GETS YOU GOING PACK

GG01 - 2 clamp tools (15mm & 20mm), a pipe cutter, and a selection of the most popular fittings.



## BUTE PRO STARTER PACK

BPP10 - 2 ProClamp Tools (PRO18 & PRO22), a pipe cutter and selection of useful fittings.



## ELECTRIC CLAMP TOOL AND JAWS

ET01 - Boxed kit includes tool with battery, charger and a set of 3 jaws (as below).

ETJ18 - 15mm jaws

ETJ22 - 20mm jaws

ETJ28 - 28mm jaws

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



## BUTE FITTINGS CASE

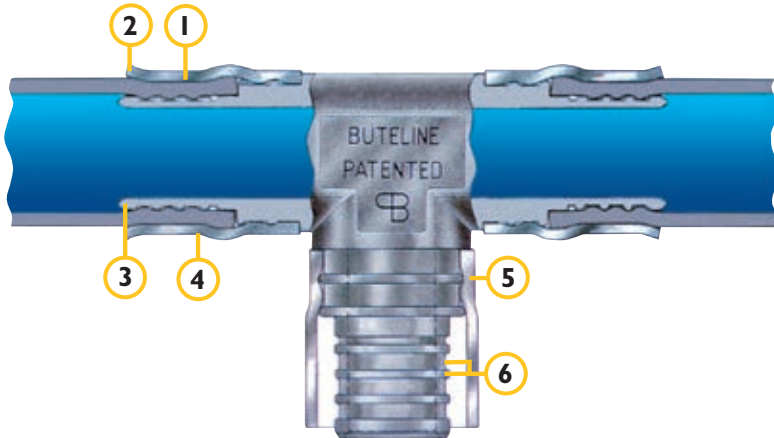
BUTEFC - A quality fittings case with a great selection of Bute fittings, T-shirt and pipe cutter.

BUTECC - This tough and durable tradesman's case is also available empty.

# Buteline Fittings

Buteline have developed an extensive range of quality fittings which have complete compatibility with Buteline Polybutene-1 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 Buteline fittings will therefore find the total concept much quicker and more economical than other available systems.



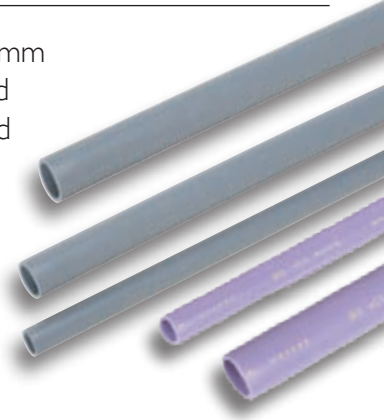
- 1 WIDE FORGED CLAMP**  
Minimum working stress applied (approx. 0.5 ton per sq. in.) allowing pipe material to "flow" into insert tail grooves.
- 2 2mm WIDE FLARE**  
No stress from clamping transmitted to insert tail or pipe at end of fitting. End of metal sleeve cannot impinge into pipe, even in 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 SEALING RIBS**  
Narrow lands with wide grooves, ensure clamp stress is transferred into the pipe joint efficiently.

## Buteline Polybutene-1 Pipe

Buteline Polybutene-1 pipe is produced in 15mm, 20mm and 28mm sizes. 15mm and 20mm sizes are supplied in 50m coils or 5m straight lengths (100m, 150m and 200m coils are available by special request). 28mm is available in 5m straight lengths only. 15mm size pipe is now also available in 10m straight coils.

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

Buteline pipe is manufactured to meet the exacting Australian and New Zealand Standard AS/NZS 2642.



Buteline Polybutene-1 pipe is approved for use on both hot and cold potable water services. It also complies with the AS/NZS 4020 Food Grade Standard. Flexible, tough and non-corrosive, Buteline Polybutene-1 pipe can withstand high temperatures and pressures (see page 31).



Manufacturing coils on the Buteline Pipewinder



The pipe extrusion process

# Buteline 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 Buteline clamp tool is available in three sizes to suit 15mm, 20mm and 28mm Polybutene-1 pipe fittings.

The 15mm and 20mm tools are now available as alternatives in a NEW and improved mini size as pictured below (ProClamp). An electric tool is also available, with jaws in 15mm, 20mm and 28mm available individually for purchase.



Standard Clamp Tool

ProClamp Tools

Mini Electric Clamp Tool  
& Bute Jaws

## Servicing Your Clamp Tool

Buteline PB-1 clamp tools are a very important part of the system. They are extremely robust and designed to perform up to a consistent high standard for many years. Service your clamp tool by cleaning and oiling moving parts regularly. The standard clamp tools do not require adjustment.

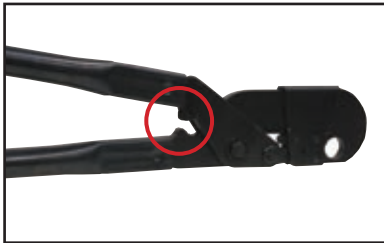
**Buteline clamp tools must only be used with the Buteline Plumbing System.**

## How To Check Your FR Clamp Tool

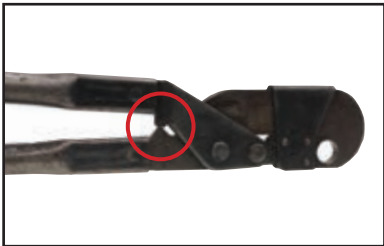
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1. To check the operation of your standard (FR type) clamp tool, hold the fixed side handle parallel to a reasonably level surface and open the moving side handle fully.



2. Let the moving handle drop under gravity. If the handle stops BEFORE it reaches the stops on the inside of the handles, the tool is OK and usable.



3. If, however, the handles close all the way to the stops, then the tool requires replacement.

NOTE: The Buteline standard FR type clamp tool is not adjustable.



Watch a demo online at [tinyurl.com/FRTTool](https://tinyurl.com/FRTTool) for more information.

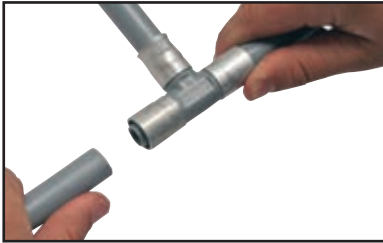


# Installation Demonstration for FR Non-Adjustable 15mm & 20mm Clamp Tools

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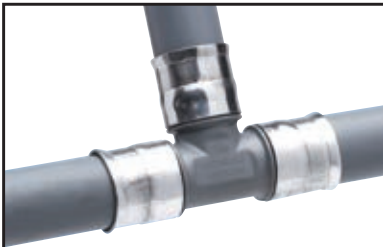
1. Cut the pipe on an indicator line with the Buteline pipe cutter.



2. Insert the pipe into the fitting. Ensure you push the pipe all the way (15mm) into the shoulder of the fitting, up to the next indicator line of the same size.



3. *Clamp-Hold-Release*  
Clamp approximately 2mm in from the end of the fitting, close the tool handles completely to the stops provided, and hold firmly for around 2 seconds then release.



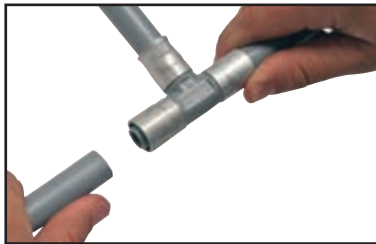
4. The process of installing the system is clean and quick, leaving a watertight mechanical joint.



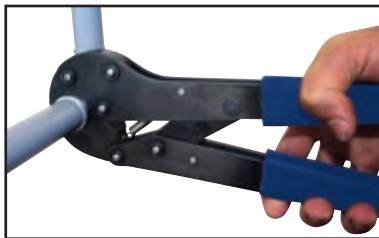
## Installation Demonstration for 15mm & 20mm ProClamp Tools & 28mm Clamp Tool



1. Cut the pipe on an indicator line with the Buteline pipe cutter:

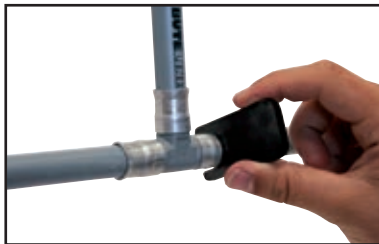


2. Insert the pipe into the Buteline fitting. Ensure you push the pipe all the way (15mm) into the shoulder of the fitting, up to the next indicator line of the same size.



### *Clamp-Hold-Release*

3. Clamp once only, approximately 2mm in from the end of the clamp ring. Close the clamp tool handles completely, holding firmly for around 2 seconds and then the tool will release.

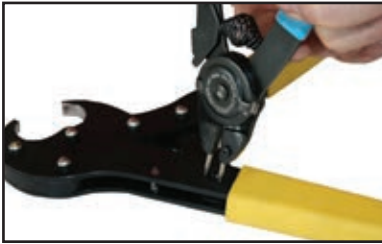


4. Use the gauge provided to check that the full clamp force has been achieved. If the gauge does not pass over the ring, the ring is under-clamped. It is important that the gauge passes over the clamp ring. Take corrective action by re-adjusting the tool (see pages 16 & 17) and then re-clamping.

# 15mm & 20mm ProClamp Tool Adjustment Instructions



1. Identify the position of the adjuster cam by locating the dot on the hexagonal end of the 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 is achieved when the adjusting cam is rotated 180°. Do not adjust your ProClamp Tool more than 5 times in its life cycle.*

## 28mm Clamp Tool Adjustment Instructions

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1. Remove the screw and the locking plate.
2. Rotate the adjuster in the direction of the arrow shown on the plate by 1 notch.
3. Replace the locking plate and the screw.
4. Check for correct clamp width.

## Installation Guide

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Treat Buteline Polybutene-I installations in a tradesman-like manner. Use the complete “Buteline” system – clamp tools, pipe, fittings, etc.

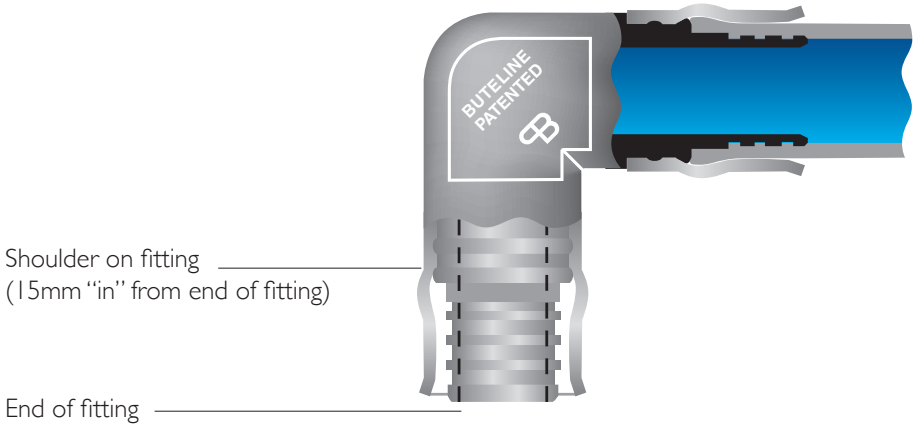
### Preparation Of Pipe

- (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.

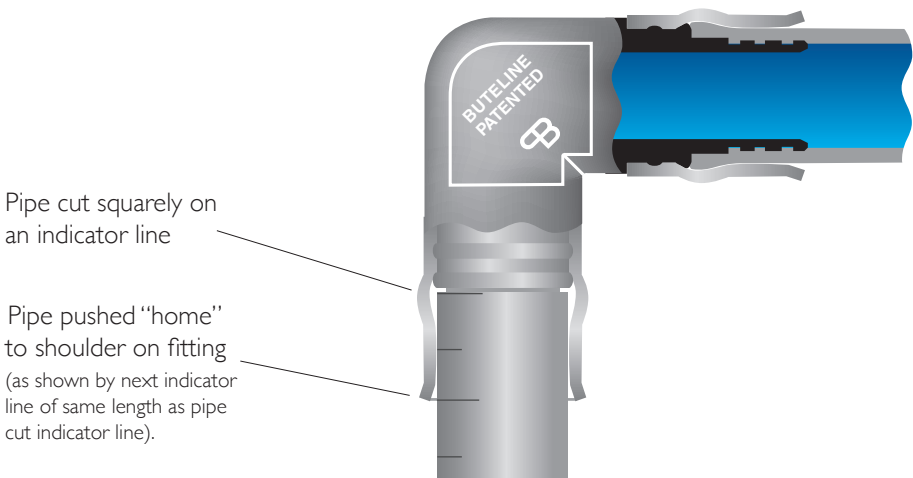


## Position Of Fittings

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



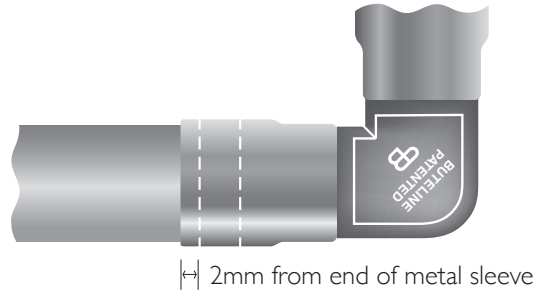
- (b) Fully insert (push home to shoulder) the pipe into Buteline fittings, up to the next visible indicator line of the same size to ensure full engagement of pipe into the fitting.



## Clamping Buteline Fittings

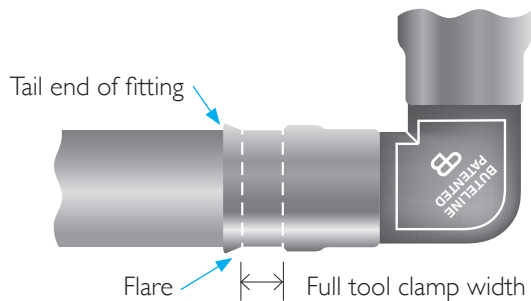
- (a) Position the Buteline clamp tool squarely and approximately 2mm in from the end of the factory fitted reinforcing clamp ring.

### Correct Clamp Tool Position



- (b) Close clamp tool handles completely (to the stops provided), 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 Buteline 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 and ensure you clamp all fittings on the job.

- (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 Buteline System

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

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

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

- ✓ The Buteline clamping method has proven to be one of the fastest, most reliable PB-I plumbing systems available.
- ✓ Buteline produces an extensive range of useful and innovative fittings.
- ✓ Buteline's total commitment and total dedication to the plumbing industry. Buteline will always be the leader in Polybutene-I plumbing systems.
- ✓ Buteline's plumbing system is designed for the professional plumber.

## Storage and Handling

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- (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 Buteline Plumbing System away from chemicals, solvents, cements, oxidising agents or petroleum products.
- (c) Store the Buteline system away from direct sunlight and high temperature sources (e.g: heaters, boilers, gas / central heating / appliance vents).



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



## “Feeding” Buteline PB-1 Pipe Through Timbers

- (a) “Pipe sleeves” and bored holes should be large enough to allow free movement of Buteline PB-1 pipe.

### Minimum Hole Sizes:

Use 20mm drills for – 15mm pipe (Type 18)

Use 25mm drills for – 20mm pipe (Type 22)

Use 32mm drills for – 28mm pipe (Type 28)

- (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 Buteline 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 PB-1 pipe.*

### NOTE:

*If running Buteline PB-1 pipe through steel framing, use plastic grommets (as supplied by the steel frame fabricator) to protect the pipe from sharp metal edges.*



## Bending Radius

Buteline Polybutene-I 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.

Pipe Size	Minimum Bending Radius
15mm (O.D. 16mm) (Type 18 Class 16)	160mm
20mm (O.D. 22mm) (Type 22 Class 16)	220mm
25mm (O.D. 28mm) (Type 28 Class 16)	280mm

## Pipe Clipping

There are 2 types of Buteline pipe clips available:



Timber / masonry clip



Metal framing screw clip

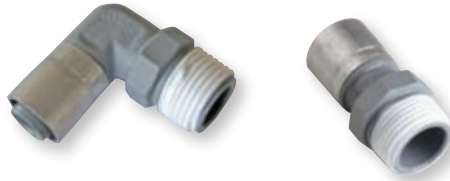
- (a) Remember that Buteline PB-I Pipe is flexible but must not be “anchored tightly” between two points.
- (b) Pipes unsupported by clips are unsightly and can be damaged.

Maximum spacing of clips (metres)		
PB-I Pipe	Horizontal or graded pipes	Vertical pipes
Type 18	0.60	1.2
Type 22	0.70	1.4
Type 28	0.75	1.5

## Buteline Polymer Threaded Connections

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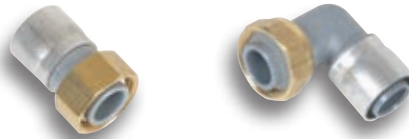
- (a) It is essential to use (PTFE) pipe thread tape - use a small amount and wrap correctly onto male thread connectors (ME15, M20, etc).
- (b) Avoid using liquid thread sealer compounds on Buteline polymer threaded fittings.
- (c) **DO NOT OVERTIGHTEN AS THREADS ARE TAPERED** and therefore will tighten with less turns compared to male parallel threads. Hand tighten plus a  $\frac{1}{2}$  turn.



## Buteline Swivel Connections

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- (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 Buteline fittings (TC15, TK15 etc.), use only an olive (plastic 'relf' ring or similar), or crox and connect - there is no need for hemp.

## Connecting to 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 plastic 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 PB-I tail of the fitting, ensuring it goes fully up to the fitting shoulder.



5. Simply insert the PB-I pipe into the Buteline fitting and push fully home to the shoulder of the fitting.



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

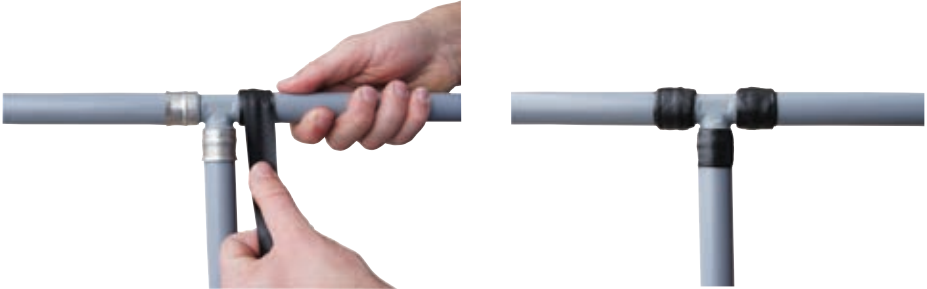


7. Finished.
  - The process is complete!
  - Installing the Buteline System is quick and secure and always provides a visual indicator of joint completion.

## Installing Buteline Underground

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- (a) If 'jointing' underground is necessary, wrap the aluminium rings directly and completely using polythene building tape or PVC insulation tape or similar.



- (b) New water mains – take Buteline PB-I 20mm / 28mm pipe from water meter to dwelling. This practice will give maximum water flow at all service points.
- (c) Lay Buteline PB-I 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.
- (d) Trench depth and installation must conform to plumbing and drainage regulations.

## Installing Buteline in Concrete / Masonry

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- (a) Use a pipe sleeve when burying Buteline PB-I 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) Buteline PB-I 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 polythene building tape or PVC insulation tape or similar. (please refer to photos under point (a) on page 28).

## Installing Buteline in Marine Environments

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When installing in marine environments where the fittings are subject to salt water exposure, wrap the aluminium rings directly and completely using polythene building tape or PVC insulation tape or similar. (Please refer to photos under point (a) on page 28).

## Freezing Conditions

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Buteline PB-I pipe is the best choice for water reticulation in climates where freezing conditions are possible.

Buteline PB-I 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 the problem by taking the following precautions:

- ✓ Make sure that any metal pipe to PB-I 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 PB-I pipe.
- ✓ Bury PB-I pipe where practical.
- ✓ Insulate PB-I pipe heavily where freezing conditions may prevail.
- ✓ Avoid placing PB-I pipework within 'polar-facing' walls, where practical.

## UV Exposure

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The Buteline System should be adequately protected 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

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Buteline PB-I 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).



## Working Pressure

As stipulated in ISO 10508, the lifetime of Polybutene-1 (PB-1) pipe is 50 years and longer according to permissible working pressure / temperature.

### Buteline Class 16 PB-1 Pipe

Temperature	Pressure	
°C	kPa	P.S.I.
20	1600	232
40	1370	198
60	1050	152
70	880	128
80	740	108

**NOTE:**

*These pressure/temperature combinations are maximum and should not be exceeded.*

*Buteline PB-1 pipe has a recommended maximum long term operating temperature of 80°C and is not recommended for applications where the continuous operating temperature may exceed this limit. Buteline will not guarantee its PB-1 pipe and fittings system where long term operating may exceed 80°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 Polybutene-1 Pipe

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

Minimum Flow Required / Min		Type 18		Type 22		Type 28	
Litres	Gallons	kPa	P.S.I.	kPa	P.S.I.	kPa	P.S.I.
18.0	4	163.45	23.70	30.88	4.48	9.97	1.45
22.5	5	247.00	35.81	46.67	6.77	15.06	2.18
27.0	6	346.08	50.18	65.39	9.48	21.11	3.06
31.5	7	460.29	66.74	86.96	12.61	28.07	4.07
36.0	8	589.27	85.44	111.33	16.14	35.94	5.21
40.0	9	716.09	103.83	135.29	19.62	43.67	6.33
45.0	10	890.43	129.11	168.23	24.39	54.30	7.87

Please refer to page 44 for a Pressure Conversion Chart.

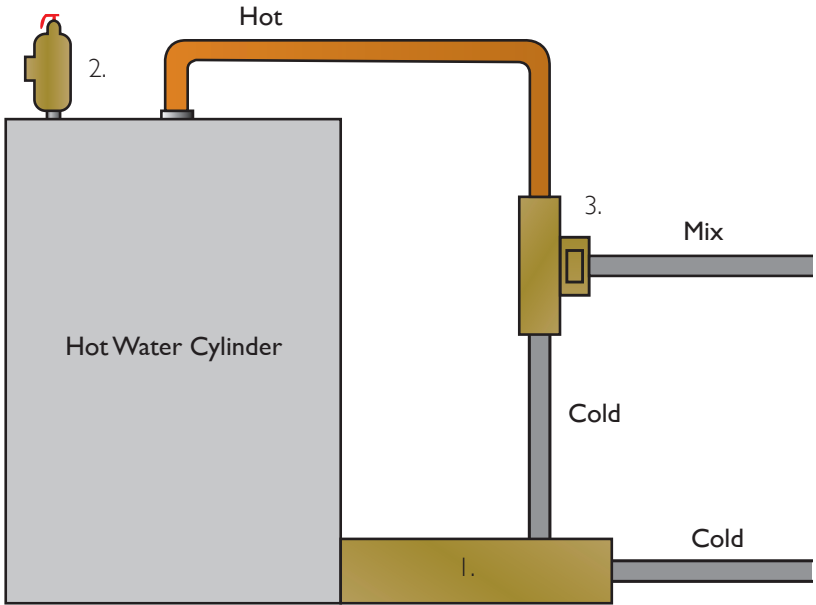
## Hot Water Installations



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- (a) Buteline PB-I installations should have a minimum of 1 metre of copper tube from the hot water cylinder. When using a tempering valve, use Buteline PB-I pipe direct from mixing outlet.
- (b) 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.
- (c) Instantaneous domestic water heaters do not require 1 metre of copper tube on the outlet. Buteline PB-I pipe can be connected directly to the outlet.
- (d) Do not use Polybutene-I pipe for “wet back” to cylinder plumbing as wet backs constantly exceed 80°C.
- (e) 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

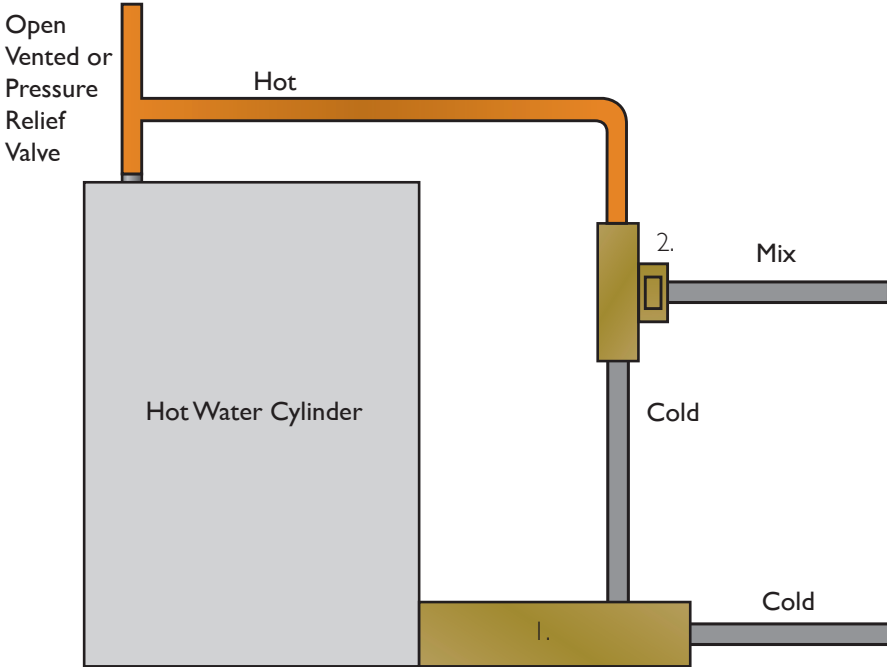




**Butline PB-I Pipe**   
**Copper Pipe (minimum 1m)** 

- 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



**Buteline PB-I 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

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As solar hot water systems are an uncontrolled heat source, temperatures over 80°C are frequently experienced, therefore the Buteline Plumbing System must be installed in a manner to protect the system from excessive temperatures.

- (a) The Buteline 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.
- (b) 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.
- (c) Do not use Polybutene-1 pipe for solar heater-to-cylinder plumbing.

## Installation Checklist

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- ✓ 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, Buteline Polybutene-I plumbing systems should be tested immediately after installation. Installations should be tested COLD.

- 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.
- Set the hot water thermostat to a maximum of 60°C and check the hot water temperature (commissioning stage).

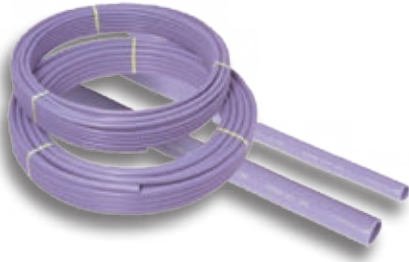
## Other Uses for the Buteline Plumbing System

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

## Non-Potable Water Piping

Lilac coloured Polybutene-1 pipe as per AS/NZS 2642 is to be used for non-potable water supplies, 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.

## Bute-1 Installation Guide

### Pipe Out Stage



1. Cut 15mm deep slots into the full width of the timber studs with a wide saw blade (eg: wall board saw, reciprocating saw or circular saw).



2. If installing the Bute-1 in metal framing, use the Bute-1 Metal Framing Fixing Angle Bracket.



Watch online on YouTube at the following web addresses:

- Bute-1 Video: [tinyurl.com/bute1info](https://tinyurl.com/bute1info)
- Buteline Metal Framing Bracket Installation Video: [tinyurl.com/MFB1install](https://tinyurl.com/MFB1install)





3. Assemble the Bute-I by following the instructions enclosed in the box, clicking it together and then pushing the supplied screws through the holes to hold the assembly together. Then screw the assembled fitting to the angle brace.

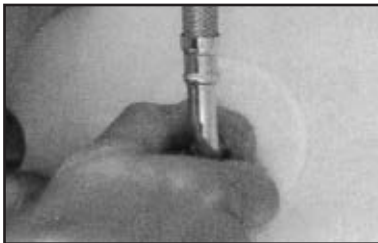


4. Tighten (nip) the Bute self-sealing protective test cap with the Bute palm spanner supplied. (No washers or thread tape etc. required). Fit pipe and clamp.



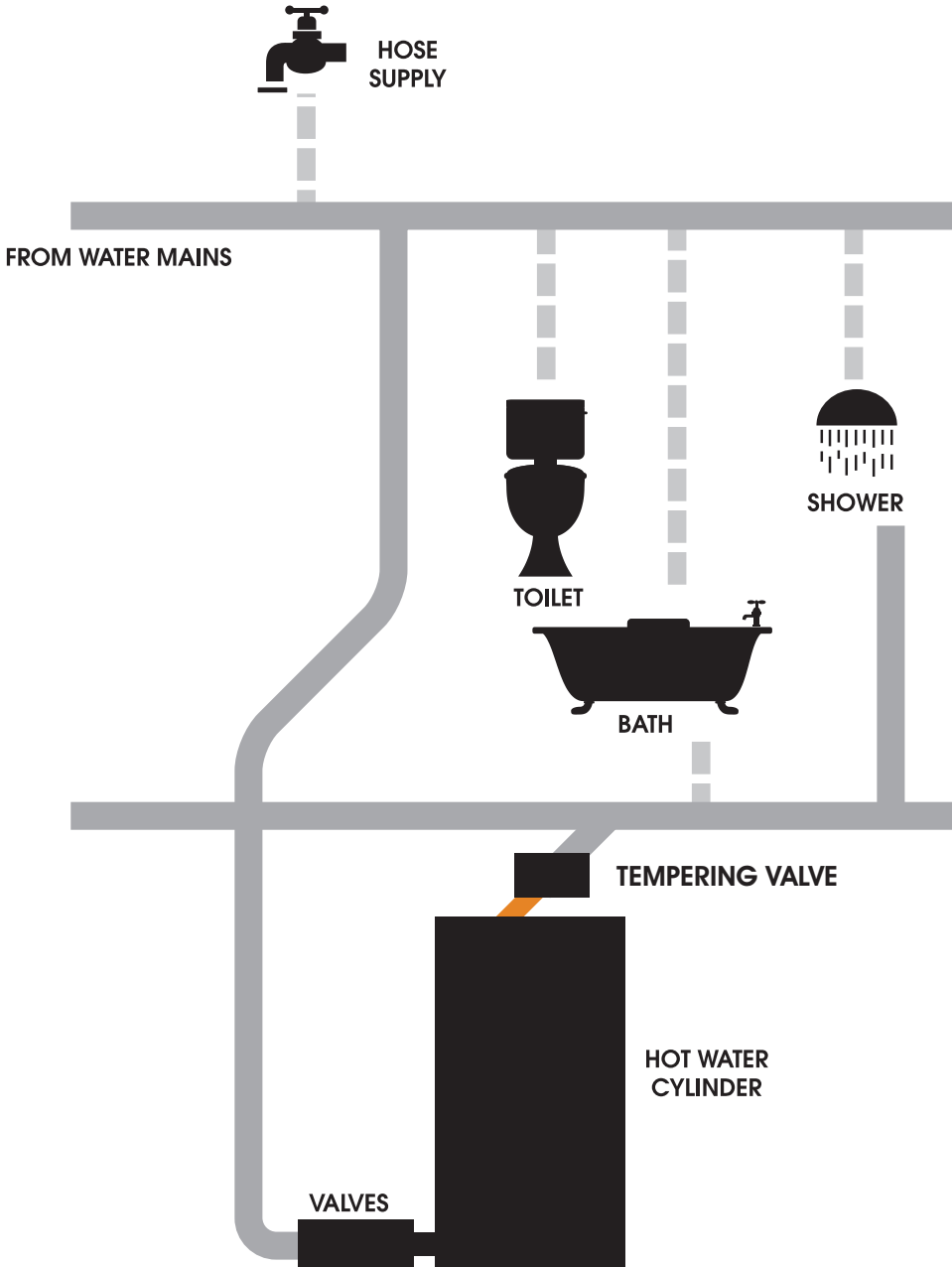
5. Pull the Bute-I fitting into the fully forward position.

### Fit Off Stage

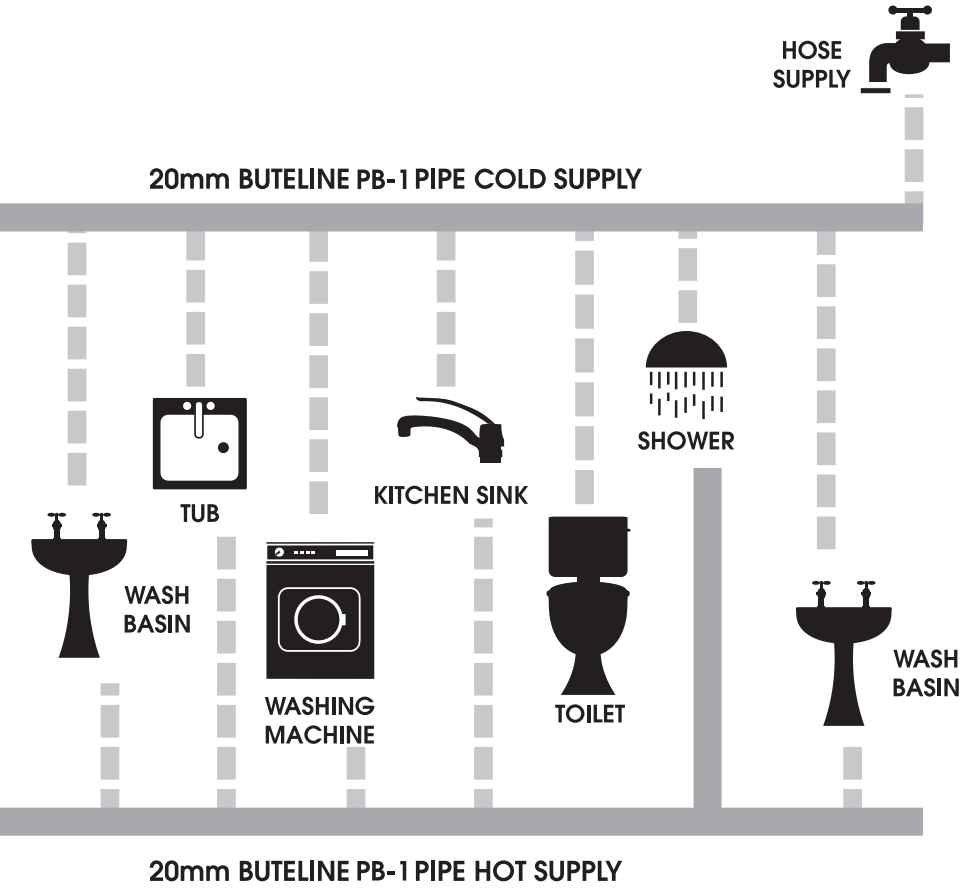


1. Remove the Bute self-sealing protective test cap with the Bute palm spanner and drain.
2. Fit wall flange (if necessary) and then connect the appropriate fitting and do not overtighten.
3. Push back the Bute-I until contact is made with the wall lining.

# Typical Method Of Plumbing



# Using Buteline PB-1 Water Mains As Shown



-  20mm BUTELINE PB-1 PIPE
-  15mm BUTELINE PB-1 PIPE
-  COPPER PIPE

## Definition Of Terms

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### **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.

## **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. Polybutene-1 design stress 1000 P.S.I. = test pressure 240 P.S.I. on 15mm pipe (Class 16 Type 18). 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.

## **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	PS.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. 1 metre head = 3.28ft head

2. 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 Buteline Guarantee

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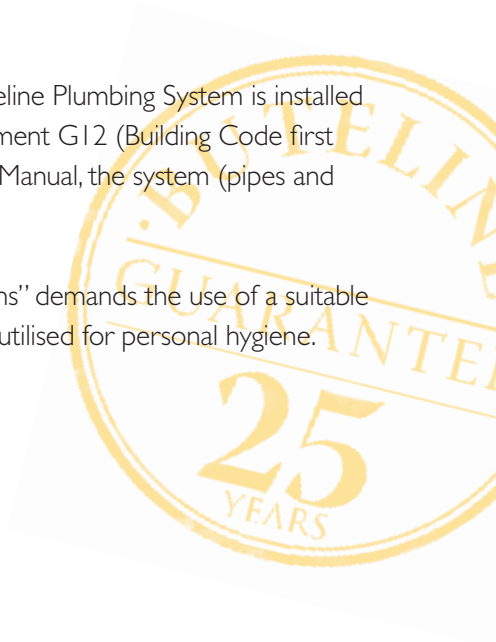
### To whom it may concern,

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

The Buteline 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 standard AS/NZS 2642.

It should be stated therefore that when the Buteline Plumbing System is installed to meet all the requirements of approved document G12 (Building Code first published July 1992) and the Buteline 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.



#### Disclaimer

This manual is only a general guide to the Buteline 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.

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