

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

## Plumbers Technical & Installation Manual

The Complete Plumbing System



**WaterMark**

AS/NZS 2642  
Lic: WMKA 1639  
Lic: WMKA 1640  
SAI Global



Quality  
ISO 9001



**Australian  
Standard**

AS/NZ 2642 LIC 1639  
LIC 1640  
Standards Australia

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

# Contents

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Buteline and Its Commitment	1
The Proven Buteline System	2
Why Plumbers Use the Buteline Plumbing System	3
Green, Sustainable Plumbing	4
Buteline Plumbing System - 18mm, 20mm, 22mm & 28mm Range	5
Buteline Fittings	13
Buteline Polybutene-I Pipe	14
Buteline Recycled Water and Rainwater Systems	15
Buteline Clamp Tools	16
Installation Demo for FR Non-Adjustable Clamp Tools	17
Installation Demo for ProClamp Tools & 28mm Clamp Tool	18
Adjustment Instructions for 18mm & 22mm ProClamp Tools	19
Adjustment Instructions for 28mm Clamp Tool	20
Installation Guide	21
Use Only the Complete Buteline System	24
Storage & Handling	25
Feeding Buteline PB-I Pipe Through Timbers	25
Bending Radius & Pipe Clipping	26
Buteline Polymer Threaded Connections & Swivel Connections	27
Installing Buteline Underground	28
Installing Buteline in Concrete / Masonry	29
Freezing Conditions, UV Exposure & Fire Protection	30
Lagging	31
Wall Thickness & Design Stress	33
Flow Rate Comparisons: Polybutene-I vs PE-X vs PP-R	35
Working Pressure	38
Buteline Pipe Pressure Head Loss	39
Hot Water Installations	40
Typical High Pressure Hot Water Cylinder	41
Typical Low Pressure Hot Water Cylinder	42
Solar Hot Water	43
Installation Checklist	44
Other Uses for Buteline & Claims Procedure	45
Bute-I Installation Guide	46
Typical Method of Plumbing	48
Pressure Conversion Chart	50
Notes	51
The Buteline Guarantee	53

# Buteline And Its Commitment

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The Buteline Professional 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.

Changing times demand new materials and new ideas! The challenges encountered in the design and manufacture of the "Plumbing system of the future" are met by the dedicated team at Buteline in a professional and dynamic manner.

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 Buteline remain leaders in plumbing technology. Our engineers and technical team thrive on the challenges presented with future product development.

The dedicated team at Buteline Australia are readily available to assist you with the best customer service when and where required.



**THE PROFESSIONAL  
PLUMBERS CHOICE**



# The Proven Buteline 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 Buteline Plumbing System is designed specifically for professional plumbers and has proven to be high quality and economical.

When the complete Buteline Plumbing System is installed in accordance with the instructions and recommendations in this manual, the Buteline Plumbing System will perform.

The Buteline Plumbing System has a proven performance record over the past three decades.



## Why Plumbers Use The Buteline Plumbing System

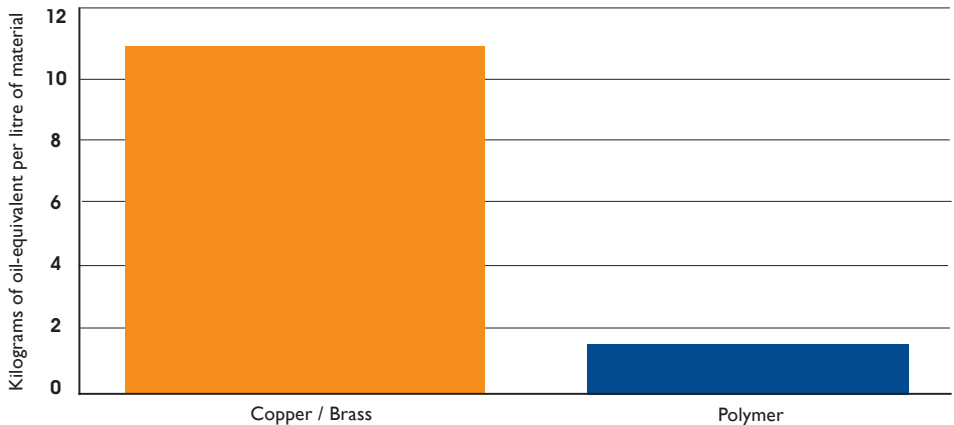
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- ✓ The Buteline PB-I Plumbing System is made in New Zealand and is readily available from leading Plumbing Merchants in Australia.
- ✓ The Buteline PB-I Plumbing System has been designed specifically for use by tradesmen, and meets the requirements 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.
- ✓ The Buteline PB-I Plumbing System delivers better flow rates than PE-X and other polymer based piping systems, and is well suited to low pressure applications and environments where energy consumption saving is important.
- ✓ 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 Australia Pty 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**

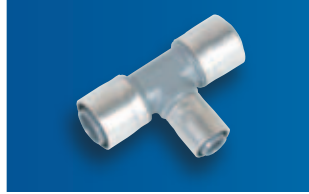


# Buteline PB-1 Plumbing System



## EQUAL TEES

T18 - 18mm x 18mm x 18mm  
 T22 - 22mm x 22mm x 22mm  
 T305 - 28mm x 28mm x 28mm



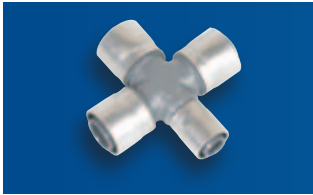
## (24) REDUCING TEES

TR112 - 18mm x 18mm x 22mm  
 TR211 - 22mm x 18mm x 18mm (27)  
 TR212 - 22mm x 18mm x 22mm (26)  
 TR221 - 22mm x 22mm x 18mm (25)  
 TR334 - 28mm x 28mm x 22mm (25)  
 TR336 - 28mm x 22mm x 28mm (26)  
 TR337 - 28mm x 28mm x 18mm (25)



## EQUAL CROSSES

CX40 - All 18mm  
 CX48 - All 22mm



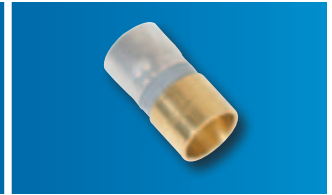
## REDUCING CROSSES

CX42 - 22mm x 22mm x 22mm x 18mm  
 CX44 - 22mm x 18mm x 22mm x 18mm  
 CX46 - 22mm x 18mm x 18mm x 18mm



## COMPRESSION ADAPTORS

FY18 - 15mm Cu x 18mm  
 FY22 - 3/4" Cu x 22mm



## BRAZING TAILS

BTM18 - Male Brazing Tail - 18mm  
 BTM22 - Male Brazing Tail - 22mm  
 BTF18 - Female Brazing Tail - 18mm  
 BTF22 - Female Brazing Tail - 22mm



## FEMALE SWIVELS

F18 - 1/2" BSP x 18mm  
 F22 - 3/4" BSP x 22mm  
 F2218 - 3/4" BSP x 18mm  
 SF350 - 3/4" BSP x 28mm  
 SF450 - 1" BSP x 28mm



## (62) INLINE COUPLINGS

S18 - 18mm x 18mm  
 S22 - 22mm x 22mm  
 S105 - 28mm x 28mm



## (1) MALE ADAPTORS

M18 - 1/2" BSPT x 18mm  
 M22 - 3/4" BSPT x 22mm  
 M2218 - 3/4" BSPT x 18mm  
 SM174 - 3/4" BSPT x 28mm  
 SM175 - 1" BSPT x 28mm

## FIXED FEMALE ADAPTOR

FF22B - 3/4" BSP x 22mm

(2)

## REDUCING COUPLINGS

S2218 - 22mm x 18mm  
 SR125 - 28mm x 22mm

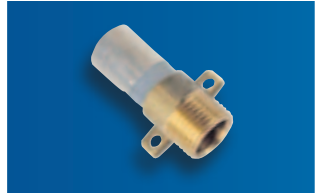
(1R)

# Buteline PB-1 Plumbing System



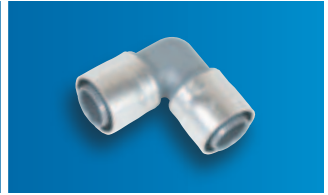
## BRASS MALE ADAPTORS (3)

M18B - 1/2" BSP x 18mm (PB-1 to Cu)  
M22B - 3/4" BSP x 22mm (PB-1 to Cu)



## BRASS LUGGED MALE ADAPTOR (5)

ML18B - 1/2" BSP x 18mm

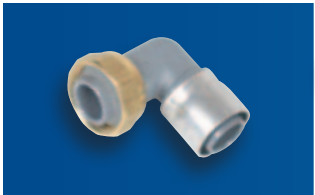


## EQUAL ELBOWS (12)

E18 - 18mm x 18mm  
E22 - 22mm x 22mm  
E205 - 28mm x 28mm

## REDUCING ELBOWS (12R)

E2218 - 22mm x 18mm  
ER224 - 28mm x 22mm



## FEMALE SWIVEL ELBOWS

EF18 - 1/2" BSP x 18mm  
EF22 - 3/4" BSP x 22mm  
EF351 - 3/4" BSP x 28mm  
EF451 - 1" BSP x 28mm



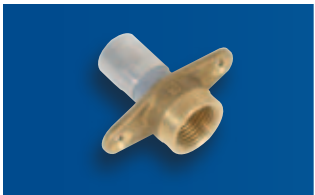
## (63) MALE ELBOWS

ME18 - 1/2" BSPT x 18mm  
EM274 - 3/4" BSPT x 28mm  
EM275 - 1" BSPT x 28mm



## (13) M&F WHITE FINISHING EXT ELBOW

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



## HOSE PLATES

HP18 - 1/2" BSP x 18mm  
HP22 - 3/4" BSP x 22mm



## FEMALE WING BACK ELBOWS (15BP)

WE18 - 1/2" BSP x 18mm  
WE22 - 3/4" BSP x 22mm  
WE2218 - 3/4" BSP x 18mm



## MALE WING BACK ELBOWS (19BP)

**Brass:**  
WM18 - 1/2" BSP x 18mm x 70mm  
WM100 - 1/2" BSP x 18mm x 100mm  
WM200 - 1/2" BSP x 18mm x 200mm  
WM202 - 3/4" BSP x 22mm x 200mm  
**Stainless Steel:**  
SWM18 - 1/2" BSP x 18mm x 88mm  
SWM22 - 3/4" BSP x 22mm x 88mm



# 18mm, 22mm and 28mm Range



## BUTE 1

### Adjustable 1/2" BSP Male Wall Elbow

BUTE-I - 1/2" BSP x 18mm x 70mm  
 BUTE-IEX - 1/2" BSP x 18mm x 100mm

Includes test caps (hot & cold), fixing screws and palm spanner.  
 Metal braces included.



## METAL FRAMING BRACKET

MFBI - Metal framing fixing angle bracket for BUTE-I braces.

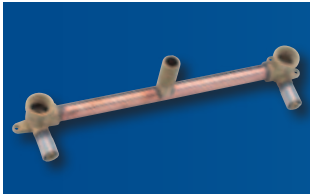
Includes metal fixing screws.



## LUGGED ELBOWS (19BP)

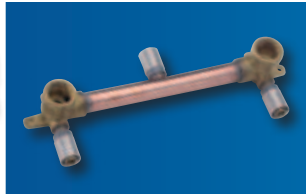
BLE70 - 1/2" BSPT x 18mm x 70mm  
 BLE100 - 1/2" BSPT x 18mm x 100mm

Includes test cap and spanner.



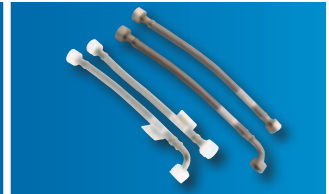
## INLINE TAP ASSEMBLIES

TA20A - 200 CRS  
 TA30A - 300 CRS  
 TA30RE - 300 CRS Rear Entry  
**Stainless Steel:**  
 STA203 - 304, 8" (203mm)



## SHOWER ASSEMBLIES

SA15A - 150CRS - 22mm Bottom Entry  
 SA15T - 150CTR - 18mm Top Entry  
 SA20A - 200CTRS - 18mm Bottom Entry  
 SA20T - 200CTR - 18mm Top Entry  
 SA30A - 300CRS - 18mm Bottom Entry  
**Stainless Steel:**  
 SSA20 - 304, 8" (203mm)



## FLEXI HOSES

1/2" BSP x 1/2" BSP x 300mm  
 FPE300 - Elbow Flexi Hose, Bute Nuts  
 FPS300 - Straight Flexi Hose, Bute Nuts  
 BMFE30 - Elbow Flexi Hose, Brass Nuts  
 BMFS30 - Straight Flexi Hose, Brass Nuts

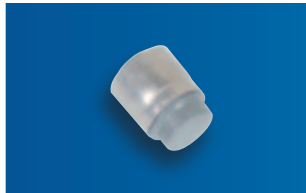


## EXTENDED TEST PLUG

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

## TEST PLUG

PH18 - 1/2" BSPT



## PIPE END PLUGS

PG18 - 18mm  
 PG22 - 22mm  
 PEP405 - 28mm

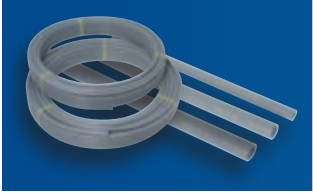


## (61) NAIL / METAL SCREW PIPE CLIPS

**Nail:**  
 BA18 - 18mm  
 BA22 - 22mm  
 BA28 - 28mm

**Metal Screw:**  
 BAS18 - 18mm  
 BAS22 - 22mm  
 BAS28 - 28mm

# Buteline PB-1 Plumbing System



## 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



**NEW!**

## PB-1 RECYCLED WATER PIPE (LILAC)

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



**NEW!**

## PB-1 RAINWATER PIPE (GREEN)

BCG18 - 18mm x 50m Coil  
 BCG22 - 22mm x 50m Coil  
 BLG18 - 18mm x 5m Length  
 BLG22 - 22mm x 5m Length



## CLAMP TOOLS

FR20 - 18mm  
 FR25 - 22mm  
 FR28 - 28mm



**NEW!**

## PROCLAMP TOOLS

PRO18 - 18mm  
 PRO22 - 22mm  
 Includes checking gauge.



**NEW!**

## ELECTRIC CLAMP TOOL AND JAWS

ET01 - Boxed kit includes tool fitted with battery, a spare battery, charger and a set of 3 jaws (ETJ18, ETJ22 & ETJ28).

ET02 - Boxed kit includes tool fitted with battery, a spare battery, charger and a set of 2 jaws (ETJ18 & ETJ22).

ETJ18 - 18mm jaws  
 ETJ22 - 22mm jaws  
 ETJ28 - 28mm jaws

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



## RATCHET CUTTER

PC25 (Red)



## PIPE CUTTER

PC30 (Orange)

## PIPE CUTTER BLADES

PC30-BT100 (for PC30)

## 18mm, 22mm and 28mm Range



### BUTE TOOL BELT

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



### BUTE GETS YOU GOING PACK

GG020 - 2 clamp tools (18mm & 22mm), a pipe cutter and a selection of the most popular fittings.



### BUTE PRO STARTER PACK

BPP11 - 2 ProClamp Tools (PRO18 and PRO22), a pipe cutter and a selection of useful fittings.



### RECYCLED WATER KITS

RWK18 - 5/8" BSP x 18mm x 200mm brass lugged elbow, lilac coloured hose tap, test cap and non-potable supply sign.

*Available late-2012.*

Buteline is pleased to announce the availability of Recycled Water pipe and Rainwater pipe in Polybutylene - I ( PB-I ) as an alternative to the existing Polyethylene Recycled Water & Rainwater system shown on pages 10 - 12.

Please note that the colours of the new PB-I Recycled Water and Rainwater pipes are still lilac and green, but are of a lighter colour and should only be connected using grey Buteline fittings, (from the PB-I Plumbing System, shown on pages 5 - 9). Please free call 1800 146 535 or ask your local Buteline representative if you have any questions.

# Recycled Water And Rainwater Systems



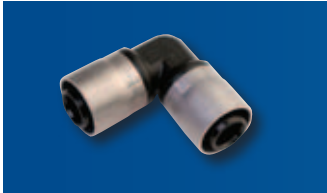
**EQUAL TEE**  
TE666 - 20mm x 20mm x 20mm



**(24) MALE TEE**  
TM66B - 1/2" BSPT x 20mm x 20mm



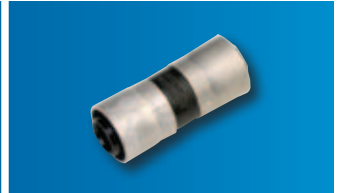
**FEMALE SWIVEL ELBOWS** (63)  
EF6B - 1/2" BSP x 20mm  
EF6C - 3/4" BSP x 20mm



**EQUAL ELBOW**  
EE66 - 20mm x 20mm



**(12) MALE ELBOWS**  
EM6B - 1/2" BSPT x 20mm  
EM6C - 3/4" BSPT x 20mm



**(13) STRAIGHT INLINE COUPLING** (1)  
SE66 - 20mm x 20mm



**STRAIGHT FEMALE SWIVELS**  
SF6B - 1/2" BSP x 20mm  
SF6C - 3/4" BSP x 20mm



**(62) STRAIGHT MALE ADAPTORS**  
SM6B - 1/2" BSPT x 20mm  
SM6C - 3/4" BSPT x 20mm



**(3) FEMALE LUGGED HOSE PLATE**  
SFL6B - 1/2" BSP x 20mm

# 20mm Range



**FEMALE LUGGED ELBOW** (15BP)  
EFL6B - 1/2" BSP x 20mm

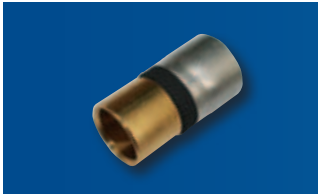


**NEW!**

**MALE WING BACK ELBOWS** (19BP)  
WM65 - 1/2" BSP x 20mm x 65mm  
WM106 - 1/2" BSP x 20mm x 100mm  
WM206 - 1/2" BSP x 20mm x 200mm  
WM226 - 3/4" BSP x 20mm x 200mm



**MALE BRAZING TAILS**  
BTM6B - 1/2" Cu x 20mm  
BTM6C - 3/4" Cu x 20mm



**FEMALE BRAZING TAILS**  
BTF6B - 1/2" Cu x 20mm  
BTF6C - 3/4" Cu x 20mm



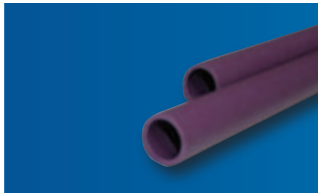
**MALE BARREL NIPPLE**  
BN421 - 1/2" BSPT x 1/2" BSPT



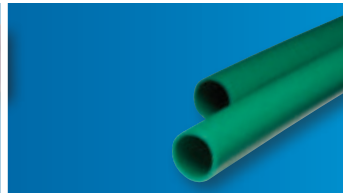
**PIPE END PLUG** (61)  
PEP6 - 20mm



**NAIL / METAL SCREW PIPE CLIPS**  
Nail:  
BA20 - 20mm  
Metal Screw:  
BAS20 - 20mm



**POLYETHYLENE RECYCLED WATER PIPE LILAC**  
HL20 - 20mm x 5m Length  
HL20C - 20mm x 50m Coil



**POLYETHYLENE RAINWATER PIPE GREEN**  
HG20 - 20mm x 5m Length  
HG20C - 20mm x 50m Coil

# Recycled Water And Rainwater Systems



## PIPE CUTTER

PC30 (Orange)

## PIPE CUTTER BLADES

PC30-BT100 (for PC30)



## BUTELINE CLAMP TOOL

CT6 - 20mm

Does not require adjustment.

Fully guaranteed tradesman's tool.



## ELECTRIC CLAMP TOOL AND JAWS

ET01 - Boxed kit includes tool fitted with battery, a spare battery, charger and a set of 3 jaws (18mm, 22mm & 28mm).

ET02 - Boxed kit includes tool fitted with battery, spare battery charger and a set of 2 jaws (18mm & 22mm).

ETJ20 - 20mm jaws

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



## RECYCLED WATER KIT

RVVK1 - 5/8" BSP x 20mm x 200mm

brass lugged elbow, lilac coloured hose tap, test cap and non-potable supply sign.

Available mid-2012.

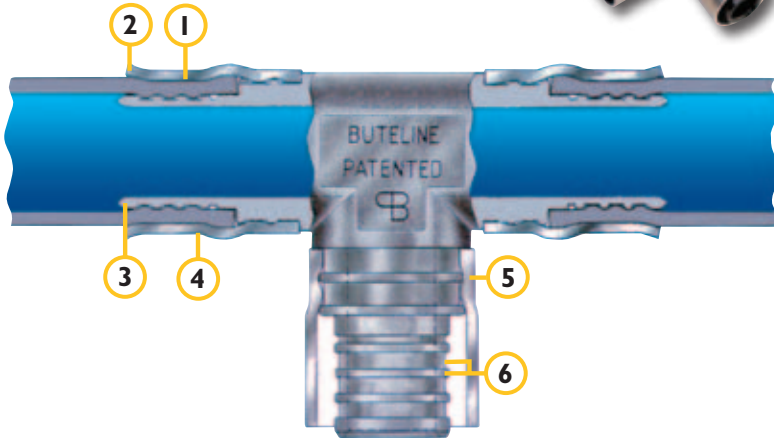
Only the black 20mm fittings featured on pages 10 - 12 can be used in conjunction with 20mm Polyethylene Recycled Water and Rainwater pipes.

For the latest product news and updates, visit [www.buteline.com](http://www.buteline.com) or call 1800 146 535 to request more information and the latest version of this manual.

# 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 Type 18 (16mm O.D.), Type 22 (22mm O.D.) and is supplied in 50 metre coils and 5 metre straight lengths (100m, 150m and 200m coils are available by special request). Type 28mm (28mm O.D.) is available in 5m straight lengths only.

Buteline PB-1 pipe is manufactured to meet the exacting Australian and New Zealand Standard AS/NZS 2642 and WaterMark 2642.

Pipe identification marks are printed at 1 metre intervals.



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 35).



Manufacturing coils on the Buteline Pipewinder



The pipe extrusion process



## Buteline Recycled Water and Rainwater Systems



Buteline now offers Recycled Water and Rainwater systems in both Polyethylene (PE) and Polybutene-1 (PB-1), with pipes available as 50m coils and as 5m lengths.

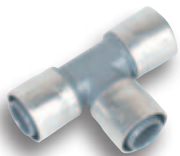
Pipe identification marks are printed at 1 metre intervals on Recycled Water (lilac) pipe and at 500mm intervals on Rainwater (green) pipe.

### Polyethylene (PE) Recycled Water & Rainwater Systems

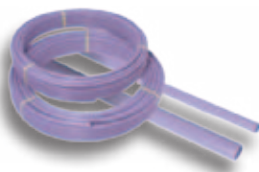
The pipes are made from Polyethylene (PE) in accordance with AS/NZS 4130, using a single extrusion process, and are coloured a solid dark lilac for Recycled Water and a solid emerald green for Rainwater. The fittings are black and are made from a high quality engineering polymer. Although the size is 20mm to prevent accidental cross-connection with potable water supply, the installation process for this system is the same as for the regular Buteline PB-1 Plumbing System – simply cut, insert and clamp your fitting for a guaranteed secure joint.



### Polybutene-1 (PB-1) Recycled Water & Rainwater Systems



The pipes are made from Polybutene-1 (PB-1) in accordance to AS/NZS 2642 and are a solid light-coloured lilac for Recycled Water; and a more olive-toned green for Rainwater.



There are 2 sizes available (18mm and 22mm) to fit the regular grey fittings from the Buteline PB-1 Plumbing System range.

## 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 4 sizes to suit Type 18, Type 22 and Type 28, with an independent tool for the Polyethylene Recycled Water / Rainwater System. An electric tool is also available, with jaws in 18mm, 20mm, 22mm and 28mm available individually for purchase.

The Type 18 and 22 tools are now available as an alternative in a NEW and improved design as pictured below (ProClamp).



Standard Clamp Tool

ProClamp Tools

Mini Electric Clamp Tool  
& Bute Jaws

### Servicing Your Clamp Tool

Buteline clamp tools are a very important part of the Buteline Plumbing System. The standard Buteline clamp tool is extremely robust, designed to perform to a consistent high standard for many years and does not require adjustment. Service your clamp tool by cleaning and oiling moving parts regularly.

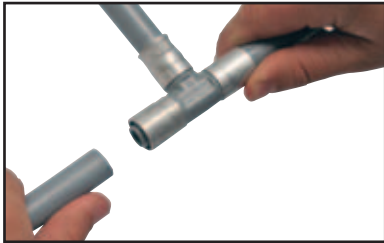
**Buteline clamp tools must only be used with the Buteline Plumbing System.**

## Installation Demonstration for FR Non-Adjustable 18mm, 20mm & 22mm Clamp Tools

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1. Cut the pipe 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.



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.

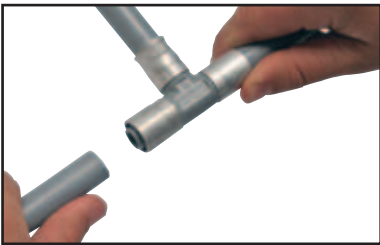


4. The process of installing the system is clean and quick, leaving a watertight mechanical joint.

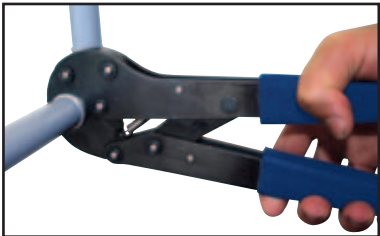
## Installation Demonstration for 18mm & 22mm using the ProClamp Tool & 28mm Clamp Tool



1. Cut the pipe with the Buteline pipe cutter.

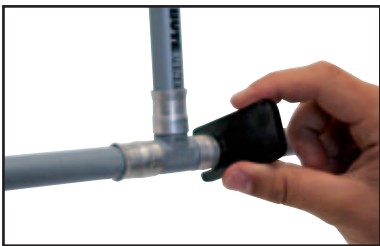


2. Insert the pipe into the Buteline fitting. Ensure you push the pipe all the way (15mm) into the shoulder of the fitting.



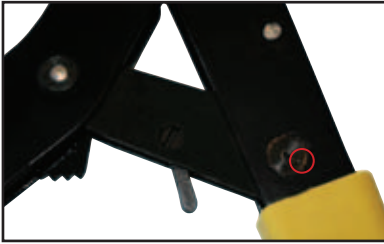
3. *Clamp-Hold-Release*

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

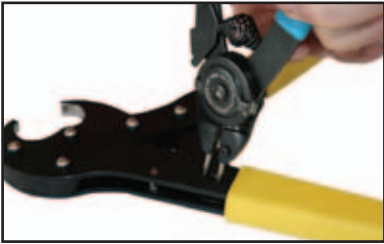


4. Use the gauge provided to check that the full clamp force has been achieved. If the gauge does not pass over the ring, the ring is under-clamped. It is important that the gauge passes over the clamp ring. Take corrective action by re-adjusting the tool (see pages 18 & 19) and then re-clamping.

# 18mm & 22mm ProClamp Tool Adjustment Instructions



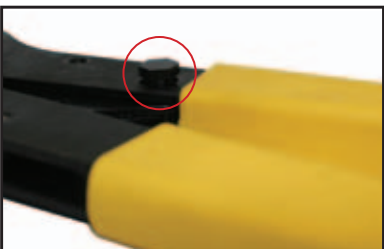
1. Identify the position of the adjuster cam by locating the dot on the hexagonal end of the cam.



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 anticlockwise, 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°.*

## 28mm Clamp Tool Adjustment Instructions



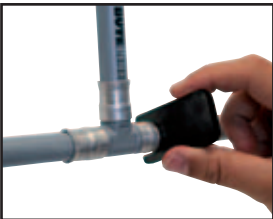
1. Remove the screw and the locking plate.



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.

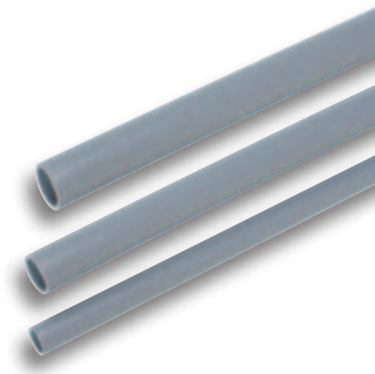
## Installation Guide

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

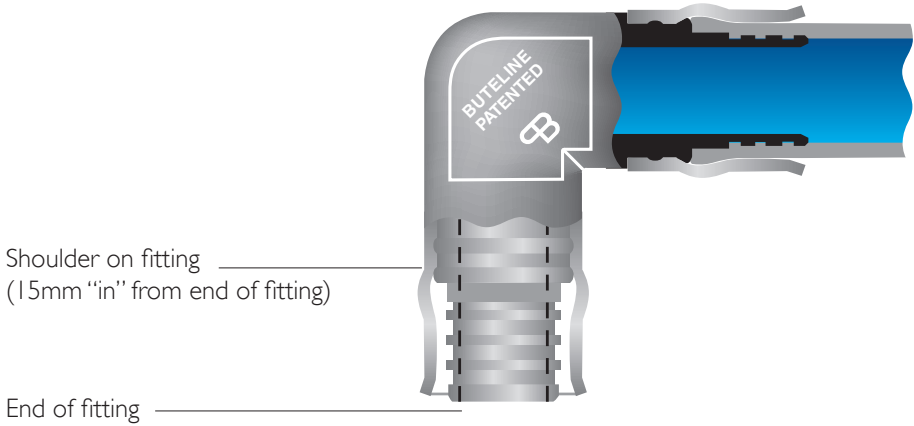
### Preparation Of Pipe

- (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 using only approved pipe cutters.

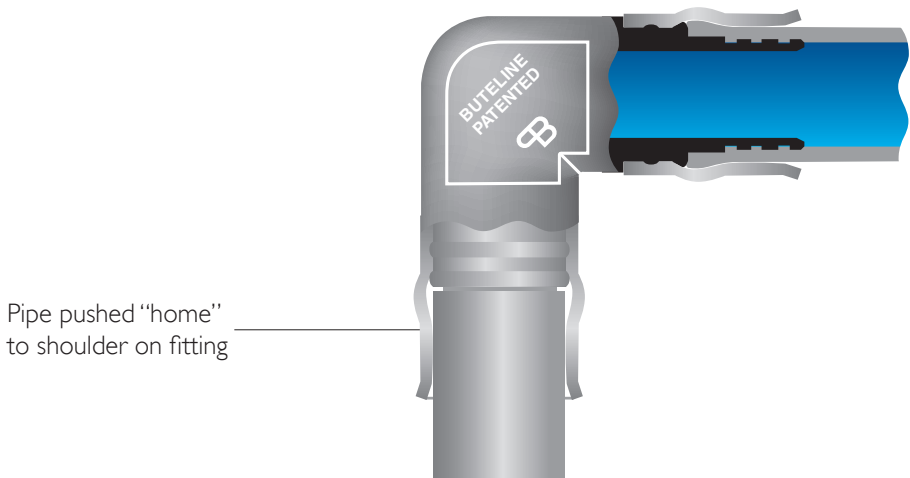


## Position Of Fittings

- (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.

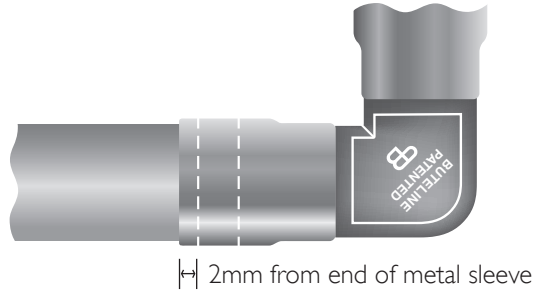




## Clamping Buteline Fittings

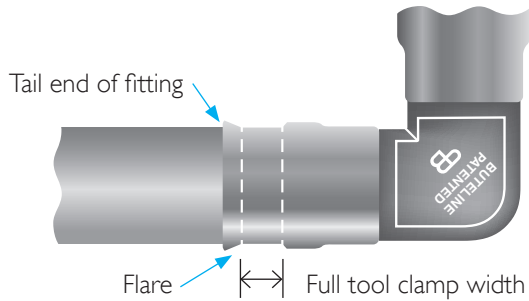
- (a) Position the Buteline clamp tool squarely and approximately 2mm in from the end of the factory fitted reinforcing clamp ring.

**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**



### NOTE:

*If the full clamp width is not achieved AND the clamp is only at the tail end of the fitting, move the clamp tool into the correct clamping position and re-clamp to achieve a correctly clamped joint - the design is such that no damage can be done to the pipe or fitting.*

- (d) Be methodical and ensure you clamp all fittings on the job.

## Use Only The Complete Buteline System

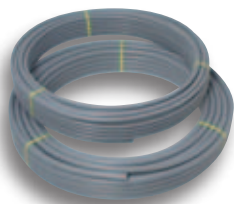
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The use of the complete Buteline System (Buteline pipe, Buteline fittings, the Buteline clamp tool) is imperative for a number of reasons:

- ✓ **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-1 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-1 plumbing systems.
- ✓ Buteline's plumbing system is designed for the professional plumber.



## 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 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).
- (d) Keep aluminium rings away from tanalised wood, galvanised iron, brass and copper piping.

## “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 18mm drills for – PB-1 Type 18 (16mm O.D.) Class 16 pipe

Use 24mm drills for – PB-1 Type 22 (22mm O.D.) Class 16 pipe

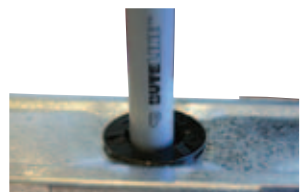
Use 30mm drills for – PB-1 Type 28 (28mm O.D.) Class 16 pipe

Use 22mm drills for – PE20 (20mm O.D.) PNI 6 Recycled Water / Rainwater 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 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-1 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
Type 18 (16mm O.D.) Class 16	160mm
Type 22 (22mm O.D.) Class 16	220mm
Type 28 (28mm O.D.) Class 16	280mm
PE20 (20mm O.D.) PN16 Recycled Water / Rainwater Pipe	300mm

## Pipe Clipping

There are 2 types of Buteline pipe clips available:



Timber / masonry clip



Metal framing screw clip

### NOTE:

Remember that Buteline PB-1 pipe is flexible but must not be “anchored tightly” between the points. Pipes unsupported by clips are unsightly and can be damaged.

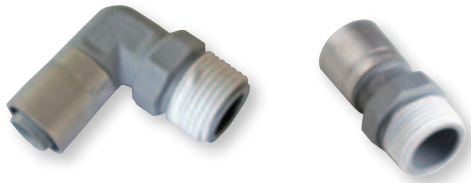
### Maximum spacing of clips (mm)

Pipe	Horizontal or graded pipes	Vertical pipes
Type 18 PB-1	600mm	1200mm
Type 22 PB-1	700mm	1400mm
Type 28 PB-1	750mm	1500mm
PE20 (20mm O.D.) PN16	700mm	1400mm

## Buteline Polymer Threaded Connections

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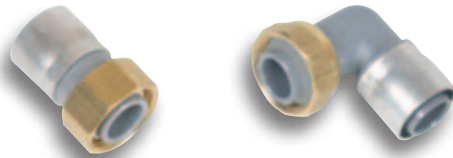
- (a) It is essential to use (PTFE) pipe thread tape - use a small amount and wrap correctly onto male thread connectors (MEI8, M22, etc). **DO NOT USE HEMP.**
- (b) Avoid using liquid thread sealer compounds on Buteline polymer threaded fittings.
- (c) **DO NOT OVERTIGHTEN AS THREADS ARE TAPERED** and therefore will tighten with less turns compared to male parallel threads.



## Buteline Swivel Connections

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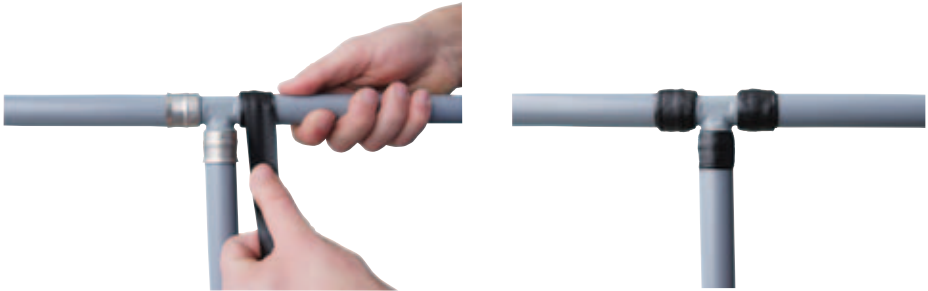
Ensure that when using female swivel connectors, the shoulder of the female is directly presented squarely to a flat machined face before tightening. This avoids crossed threads and ensures a seal. No (PTFE) pipe thread tape or sealant required.



## 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 Type 22 / Type 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

---

- (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 and the relevant parts of AS 3500 - be sure to check!
- (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) of page 28).

## Freezing Conditions

---

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 AS 3500).



## Lagging

In general, the thermal conductivity of plastics is lower than that of metals. It is the thermal conductivity of Polybutene-1 and the wall thickness of the pipe that restricts the heat loss through hot water pipes, and thereby reduces the need for lagging.

Lagging of Polybutene-1 water pipes is required where:

- 1) The pipe is installed in chases, or
- 2) Where it penetrates a concrete slab, or
- 3) To meet the energy efficiency requirements of the Plumbing and Drainage Standard AS 3500 Parts 1 & 4 and the Building Code of Australia.

Lagging is also recommended where the pipe is exposed above the ground in excessively cold climates where freezing can occur, although Polybutene-1 pipes generally cope with freezing conditions better than pipes made from other materials.

### Thermal Conductivity Comparison in Watt per metre Kelvin (W/m K)

Material	Thermal Conductivity (W/m K)
PB-1	0.185
PP	0.24
PE-X / PE-RT	0.40
Water	0.60
Steel	47.00 - 74.00
Copper	401.00

Plastic pipes such as Buteline PB-I pipe have a much lower thermal conductivity compared to copper pipes and other metal pipes. Therefore the R values are higher and heat losses are lower.

### Inherent R Values for Buteline Polybutene-I Pipe

Pipe Size	R Value
18mm PB-I	0.009
22mm PB-I	0.012
28mm PB-I	0.016

However, despite that the total R value of an insulated plastic pipe would be higher than an equivalent copper pipe insulated with the same material, please note that in applications where AS 3500 requires copper hot water pipes to be insulated, you should also insulate plastic hot water pipes using a similar thickness of insulation.

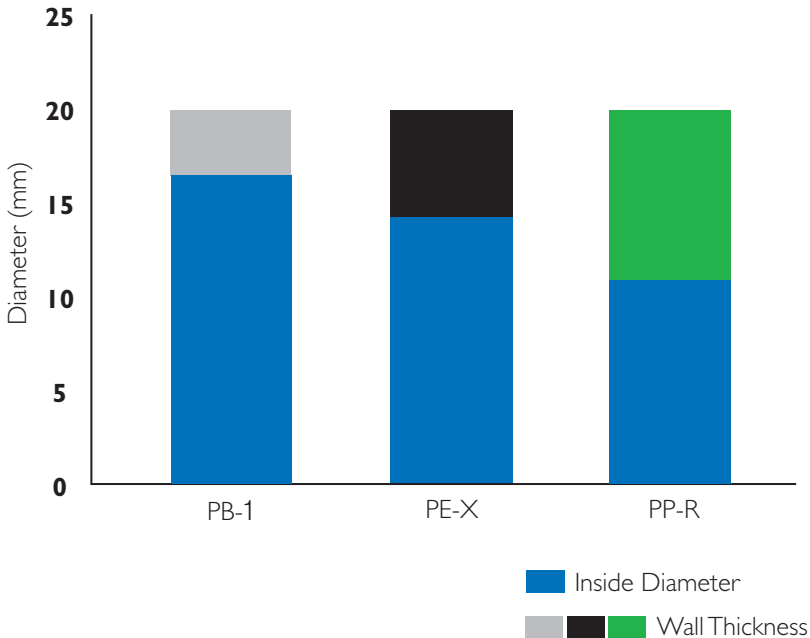
## Wall Thickness & Design Stress

Due to the chemical properties of Polybutene-1 (PB-1) raw material, only Polybutene-1 (PB-1) piping can achieve high temperature and high stress but maintain lower wall thickness to ensure adequate water-flow through the pipe network.

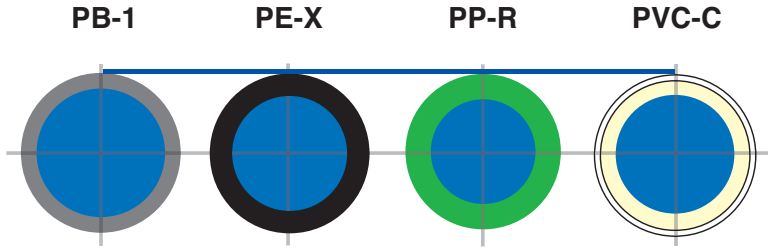
Lower wall thickness also means a larger internal bore for a given external pipe diameter, resulting in reduced head pressure loss and lower flow speeds to deliver a fixed volume of water.

A comparison of the inside diameter / thickness of Polybutene-1 (PB-1) with other plastic materials is shown in the following graph:

**Different material thickness (service life class 2 ISO 10508)**



A more visual comparison can also be made using a series of cut-away diagrams:



Buteline pipe sizes are similar to traditional metal pipe sizing, making size-for-size substitution possible. There is no need for upsizing, therefore Buteline pipe is an economical choice.

In addition to this, there is no scale build-up or corrosion with Buteline Polybutene-1 pipe.

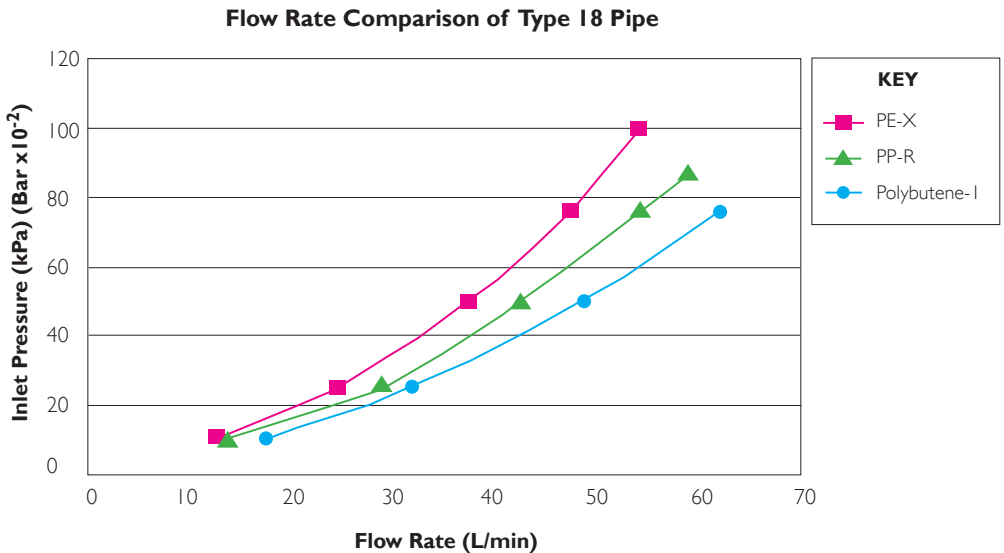
### Internal Diameter of Buteline Pipe

Pipe Size	Internal Diameter (I.D.)
Type 18 Class 16	12.4mm
Type 22 Class 16	17.6mm
Type 28 Class 16	22.3mm
20mm PN16	15.3mm

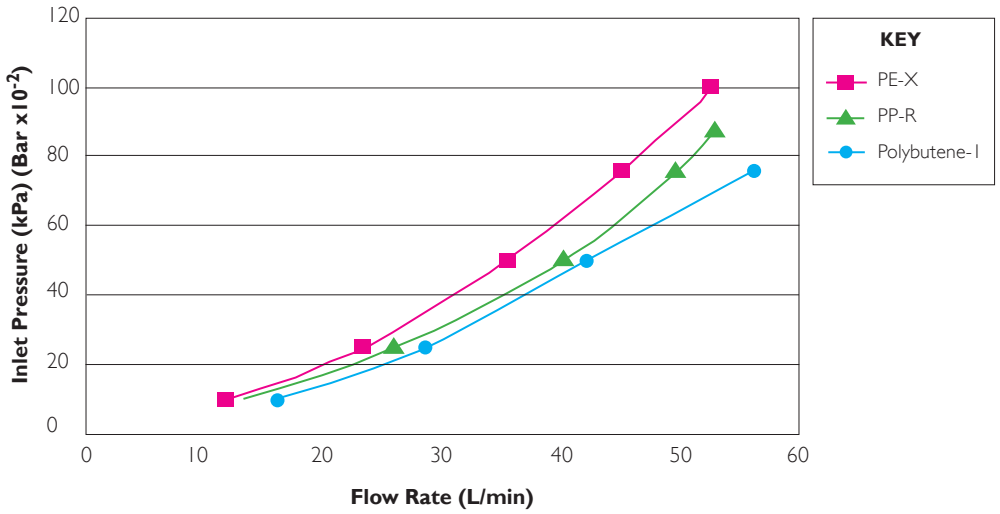
# Flow Rate Comparisons: Polybutene-1 vs PE-X vs PP-R

These below graphs show the relative flow rates for 1 metre of straight Polybutene-1 pipe compared to the PE-X and PP-R equivalents (for both Type 18 and Type 22 pipe, with a straight connector attached, and with an elbow connector attached).

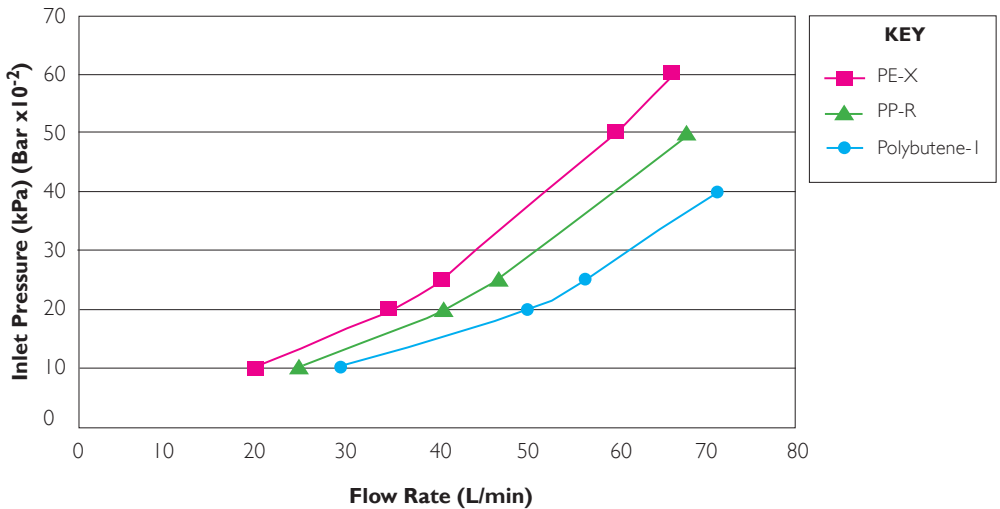
You will note that Polybutene-1 performs much better than both PE-X and PP-R.

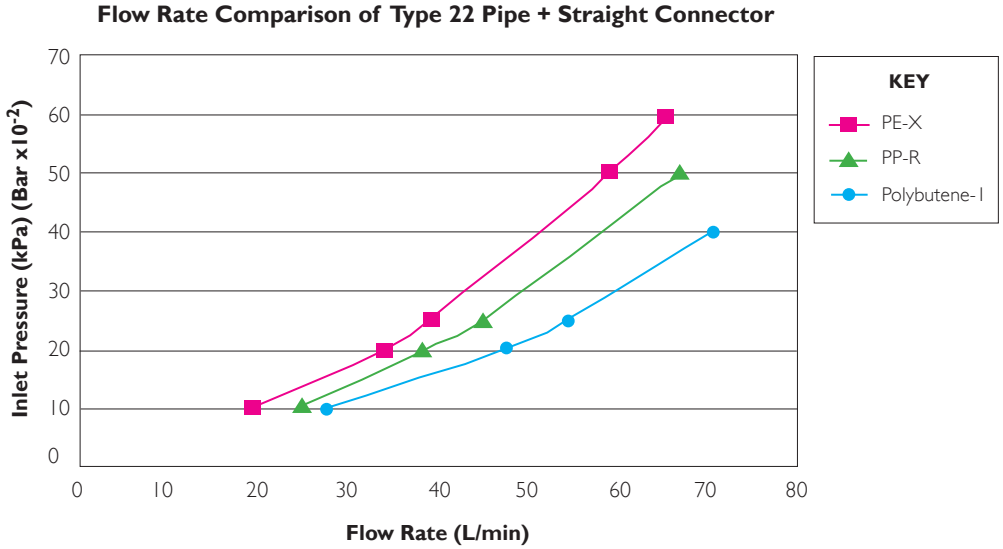


### Flow Rate Comparison of Type 18 Pipe + Straight Connector



### Flow Rate Comparison of Type 22 Pipe





It can be clearly seen that in both the 1/2" Noml (Type 18) and 3/4" Noml (Type 22) sizes, Buteline PB-I pipe out-performs the other plastic pipes in terms of permissible flow through the pipe.

In general terms, a 3/4" Noml PB-I pipe will deliver around 30% more water than the equivalent PE-X pipe at a similar pressure.

The superior flow rate of Buteline PB-I pipe gives many advantages to the end user. Energy costs are reduced as less energy is required to move the water around the system, and the excellent flow characteristics of Buteline PB-I pipe mean less turbulence within the pipework, in turn leading to a quieter plumbing system.

## 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
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 fitting 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.*

### Buteline Polyethylene Recycled Water / Rainwater Pipe

Temperature	Pressure	
	°C	kPa
20	1600	232



# Buteline Pipe Pressure Head Loss

Minimum Flow Required / min		Pressure / Head Loss Per 30 Metres (100 Feet) of Pipe											
		PB-I Type 18		PB-I Type 22		PB-I Type 28		PE20 - PNI 6					
Litres	Gallons	kPa	PS.I.	kPa	PS.I.	kPa	PS.I.	kPa	PS.I.	kPa	PS.I.	kPa	PS.I.
18.0	4	163.45	23.70	30.88	4.48	9.97	1.45	60.12	8.72				
22.5	5	247.00	35.81	46.67	6.77	15.06	2.18	90.84	13.17				
27.0	6	346.08	50.18	65.39	9.48	21.11	3.06	127.29	18.46				
31.5	7	460.29	66.74	86.96	12.61	28.07	4.07	169.29	24.55				
36.0	8	589.27	85.44	111.33	16.14	35.94	5.21	216.73	31.43				
40.0	9	716.09	103.83	135.29	19.62	43.67	6.33	263.37	38.19				
45.0	10	890.43	129.11	168.23	24.39	54.30	7.87	327.49	47.49				

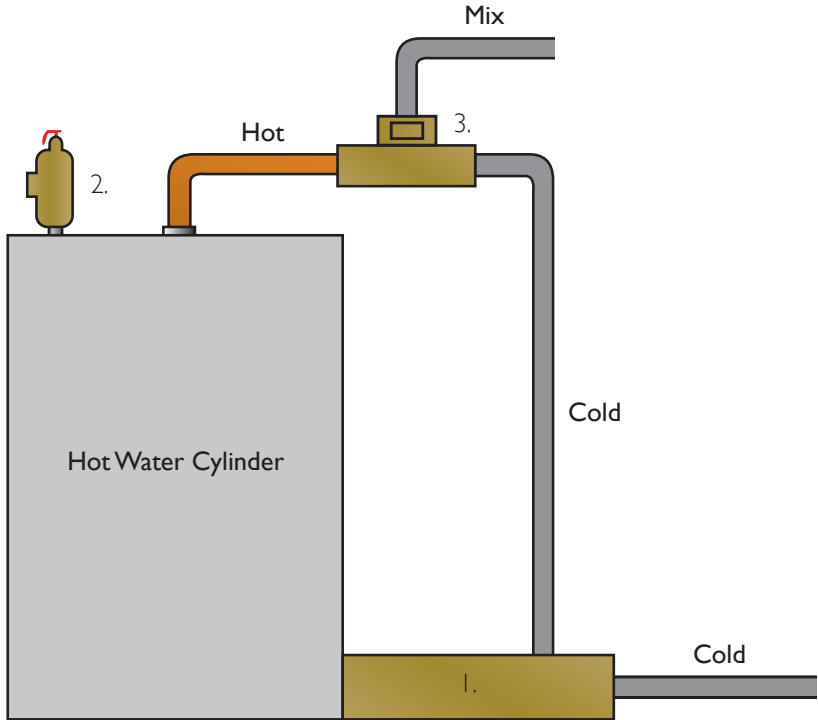
## Hot Water Installations

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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



**Buteline PB-I Pipe**



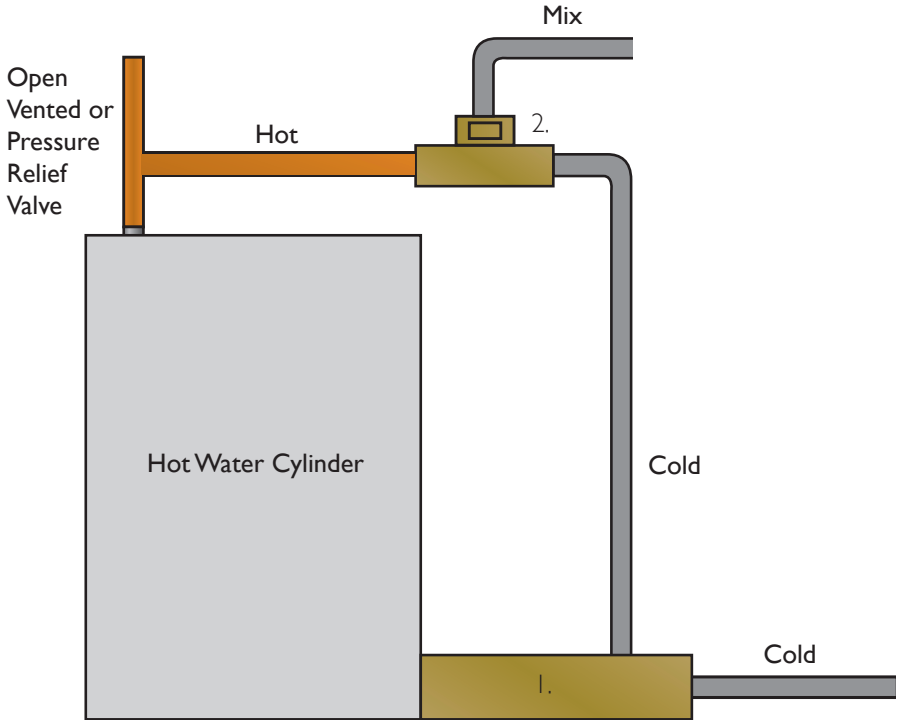
**Copper Pipe (minimum 1m)**





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

\*Ref AS 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 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 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

- (a) As with all installations, Buteline Polybutene-I plumbing systems should be tested immediately after installation. Installations should be tested COLD at 1500 kPa (220 P.S.I.) for at least 30 minutes and show no visible signs of leaks.
- (b) After passing the cold water pressure test, set the hot water thermostat to a maximum of 60°C in accordance with AS 3500.4.2:2003 and check the hot water temperature (commissioning stage).

#### NOTE:

*Please refer to AS/NZS 3500.1.2:2003 and AS/NZS 3500.4.2:2003 which provide the detailed regulations covering, for example:*

- *System flushing*
- *Filling storage tanks*
- *Isolating water heaters, fixtures, appliances and valves to avoid damage*
- *Testing under normal operating conditions*
- *Commissioning*
- *Owner/occupier operating instructions*

## 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 1800 146 535 before you proceed to install.

## Claims Procedure

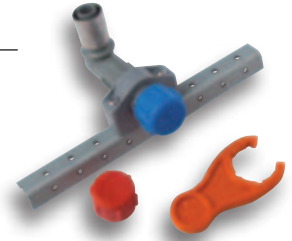
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If in the unlikely event that you wish to make a claim, please first:

1. Call your local Buteline representative.
2. Take photos and provide these to us.
3. Remove the fitting and pipework, and provide these to us.
4. Completely install and rectify the plumbing. Buteline will do our best to promptly resolve your problem.

# 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).



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

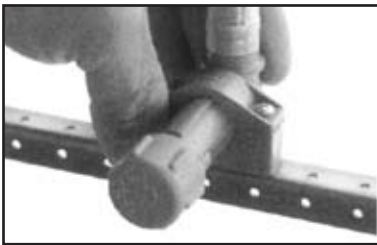


2. Assemble the Bute-1 by following the instructions enclosed in the box, clicking it together and then pushing the supplied screws through the holes to hold the assembly together. Then screw the assembled fitting to the brace.



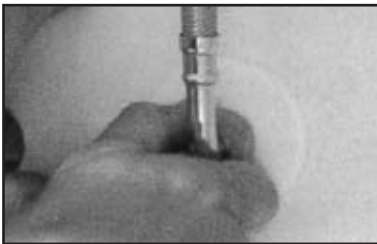


3. Tighten (nip) the Bute self-sealing protective test cap with the Bute palm spanner supplied. (No washers or thread tape etc. required). Fit pipe and clamp.



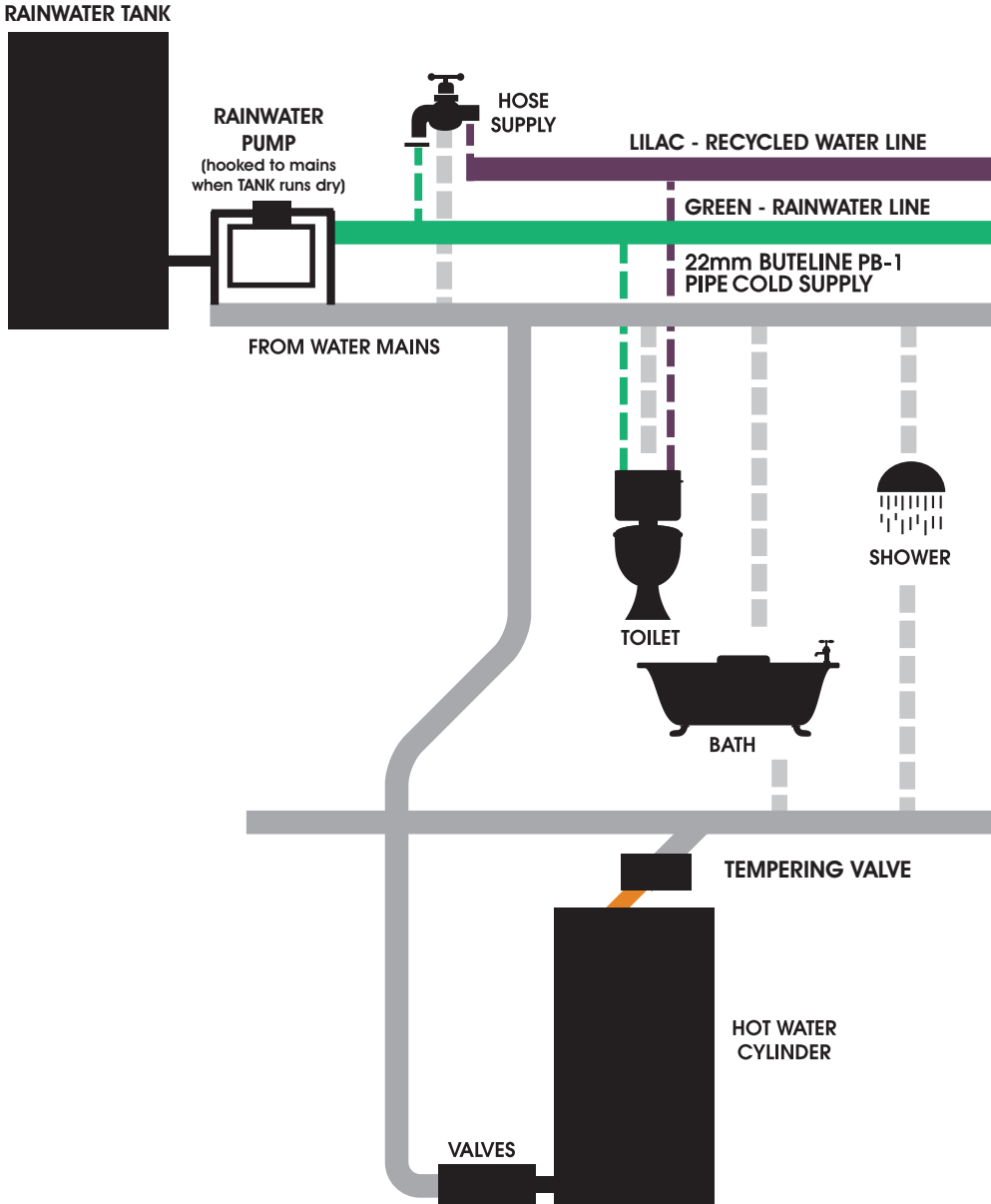
4. Pull the Bute-I fitting into the fully forward position.

### Fit Off Stage

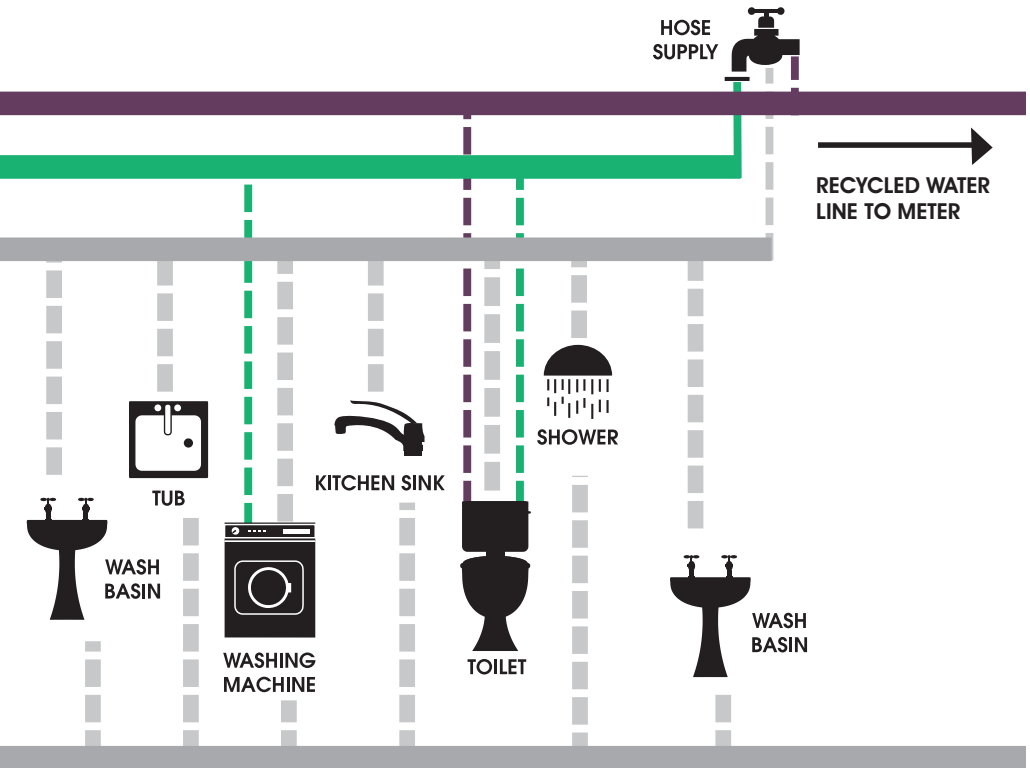


1. Remove the Bute self-sealing protective test cap with the Bute palm spanner and drain.
2. Fit wall flange (if necessary) and then connect the appropriate fitting and do not overtighten.
3. Push back the Bute-I until contact is made with the wall lining.






# Typical Method of Plumbing



# Using Buteline PB-1 Water Mains As Shown



22mm BUTELINE PB-1 PIPE HOT SUPPLY

-  22mm BUTELINE PB-1 PIPE
-  18mm BUTELINE PB-1 PIPE
-  COPPER PIPE
-  RAINWATER PIPE
-  RECYCLED WATER PIPE

## IMPORTANT NOTICE

Recycled Water / Rainwater Systems can differ in each state - Buteline Australia Pty Ltd requires installers to contact your local authority to confirm installation guidelines. It is vitally important that no cross-connection (joining together) is made between Recycled Water / Rainwater Systems and potable supply. A health hazard could occur.

## 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

# Notes

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# Notes

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## The Buteline Guarantee

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Buteline Australia Pty Ltd guarantees all of our pipes and fittings against defects in manufacturing for a period of 25 years from the date of manufacture providing the installation is carried out by a licensed plumber and in accordance with our Plumbers Technical & Installation Manual as well as with local and national plumbing codes.



### 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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