



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

1800 146 535
www.buteline.com

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Buteline And Its Commitment

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

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 of over the past three decades.

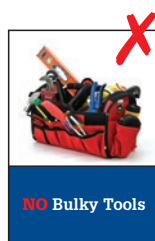
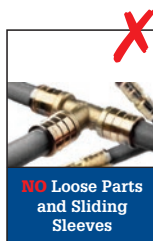


Watch our Company & Product Information
Video online at: tinyurl.com/ButelineAU



Why Plumbers Use The Buteline Plumbing System

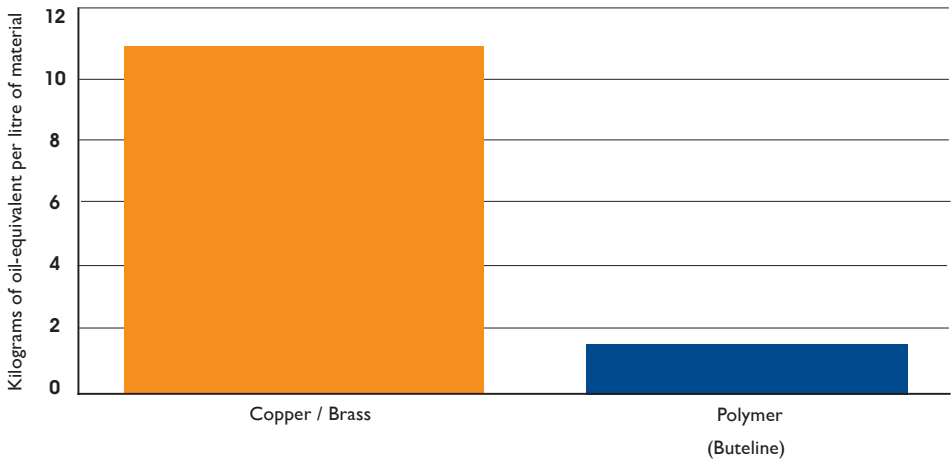
- ✓ The Buteline PB-I Plumbing System is made in New Zealand and is readily available from leading Plumbing Merchants in Australia.
- ✓ The Buteline PB-I Plumbing System has been designed specifically for use by tradesmen, and meets the requirements of AS/NZS 2642.
- ✓ The Buteline Plumbing System can 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



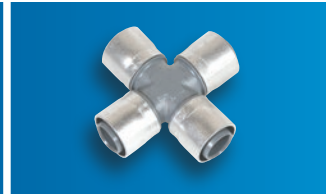
EQUAL TEES

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



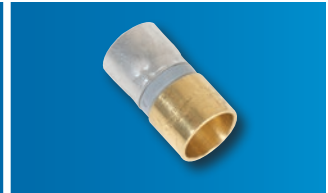
REDUCING CROSSES

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
BTF28 - Female Brazing Tail - 28mm



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

REDUCING COUPLINGS

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

(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

(3)

FIXED FEMALE ADAPTOR

FF22B - 3/4" BSP x 22mm

(2)



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



TOP FIX FEMALE WING BACK ELBOWS

WET18 - 1/2" BSP x 18mm
WET22 - 3/4" BSP x 22mm

NEW!

18mm, 22mm and 28mm Range



MALE WING BACK (19BP) TOP FIX MALE WING BACK ELBOWS

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



TOP FIX MALE WING BACK ELBOWS

WMT218 - 1/2" BSP x 18mm x 200mm

WMT222 - 3/4" BSP x 22mm x 200mm



BUTE 1

Adjustable 1/2" BSP Male Wall Elbow

BUTE-1 - 1/2" BSP x 18mm x 70mm

BUTE-1EX - 1/2" BSP x 18mm x 100mm

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

Metal braces included.



METAL FRAMING BRACKET

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

Includes metal fixing screws.

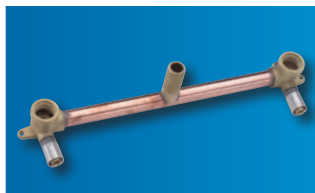


LUGGED ELBOWS (19BP)

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

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

Includes test cap and spanner.



INLINE TAP ASSEMBLIES

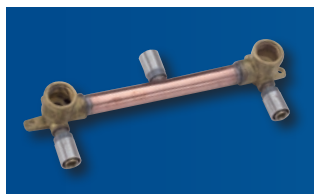
TA20A - 200 CRS

TA30A - 300 CRS

TA30RE - 300 CRS Rear Entry

Stainless Steel:

STA203 - 304, 8" (203mm)



SHOWER ASSEMBLIES

SA15A - 150CRS - 18mm Bottom Entry

SA15T - 150CTR - 18mm Top Entry

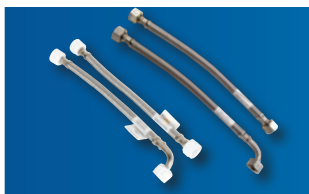
SA20A - 200CTRS - 18mm Bottom Entry

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

Buteline PB-1 Plumbing System



PIPE END PLUGS

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



(61) NAIL / METAL SCREW PIPE CLIPS

Nail:

BA18 - 18mm
BA22 - 22mm
BA28 - 28mm

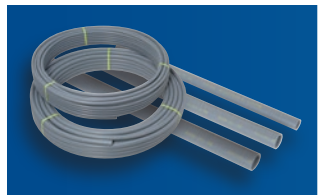
Metal Screw:

BAS18 - 18mm
BAS22 - 22mm
BAS28 - 28mm



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

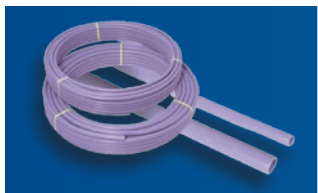
BSC18 - 5 x 18mm x 10m Lengths

BSC22 - 5 x 22mm x 10m Lengths
Coming soon in 2014.



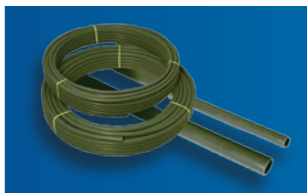
PIPE IN CORRUGATED CONDUIT

BC18X - 18mm x 25m Lengths
BC22X - 18mm x 25m Lengths



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



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

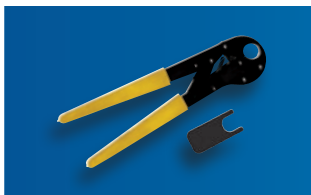
These PB-1 Recycled Water and Rainwater pipes are an alternative to the darker coloured polyethylene lilac and green pipes but should only be connected using grey Buteline fittings from the PB-1 system (shown on pages 5-9).

18mm, 22mm and 28mm Range



CLAMP TOOLS

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



PROCLAMP TOOLS

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



RATCHET CUTTER

PC25 (Red)

PIPE CUTTER

PC30



RECYCLED WATER KIT

RVK2 - 5/8" BSP x 18mm x 200mm brass lugged elbow, lilac coloured hose tap, test cap and non-potable supply sign.



BUTE TOOL BELT

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



ELECTRIC CLAMP TOOL AND JAWS

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

ET02 - Boxed kit includes tool with 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.



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

BPPI1 - 2 ProClamp Tools (PRO18 and PRO22), a pipe cutter and a selection of useful fittings.



EQUAL TEE

TE666 - 20mm x 20mm x 20mm



(24) MALE TEE

TM66B - 1/2" BSPT x 20mm x 20mm



FEMALE SWIVEL ELBOWS

EF6B - 1/2" BSP x 20mm
EF6C - 3/4" BSP x 20mm

(63)



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

SE66 - 20mm x 20mm

(1)



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



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)

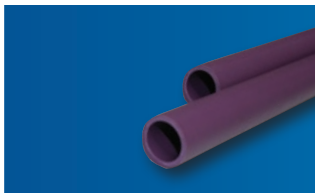
PEP6 - 20mm



NAIL / METAL SCREW PIPE CLIPS

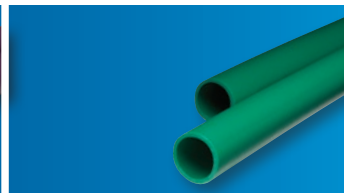
Nail:
BA20 - 20mm

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



BUTELINE CLAMP TOOL
CT6 - 20mm
Does not require adjustment.
Fully guaranteed tradesman's tool.



ELECTRIC CLAMP TOOL AND JAWS

- ET01 - Boxed kit includes tool with battery, charger and a set of 3 jaws (18mm, 22mm & 28mm).
ET02 - Boxed kit includes tool with 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.

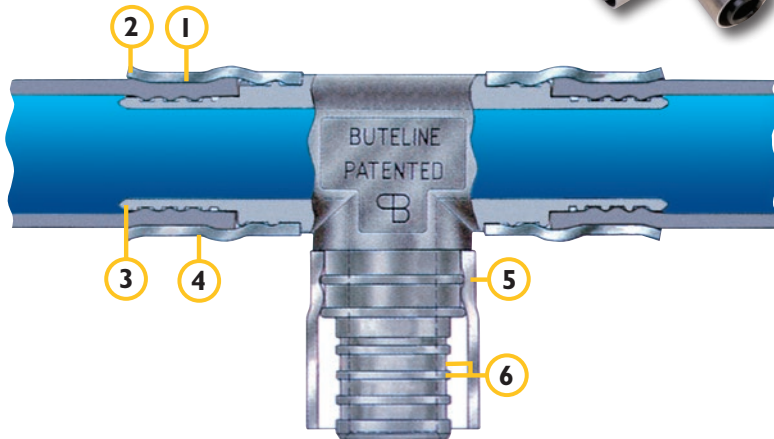
Only the black 20mm fittings featured on pages 10 - 12 can be used in conjunction with 20mm Polyethylene Recycled Water and Rainwater pipes.

For the latest product news and updates, visit www.buteline.com 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-I 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.

Type 18 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 PB-1 pipe is manufactured to meet the exacting Australian and New Zealand Standard AS/NZS 2642 and WaterMark 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 40).



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-I (PB-I), 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

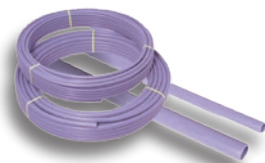
The pipes are made from Polyethylene (PE) in accordance with AS/NZS 4130, using a single extrusion process, and are coloured a solid dark lilac for Recycled Water and a solid emerald green for Rainwater. The fittings are black and are made from a high quality engineering polymer. Although the size is 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-I 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-I (PB-I) 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-I 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

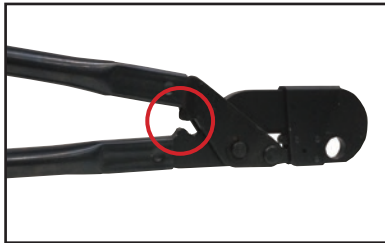
Buteline clamp tools are a very important part of the Buteline Plumbing System. The standard Buteline clamp tool is extremely robust, designed to perform to a consistent high standard for many years and does not require adjustment. Service your clamp tool by cleaning and oiling moving parts regularly.

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

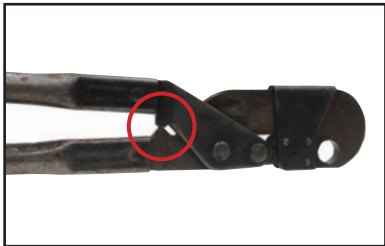
How To Check Your FR Clamp Tool



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.



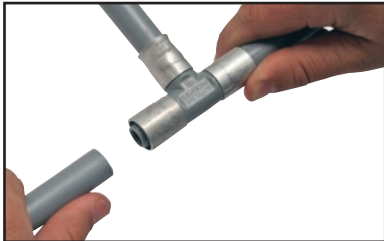
Watch a demo online at tinyurl.com/FRTTool for more information.



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



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.

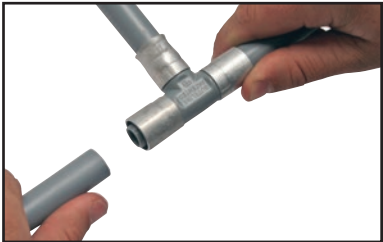


4. The process of installing the system is clean and quick, leaving a watertight mechanical joint.

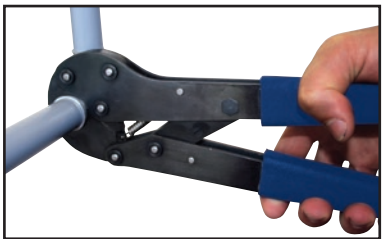
Installation Demonstration for 18mm & 22mm ProClamp Tools & 28mm Clamp Tool



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

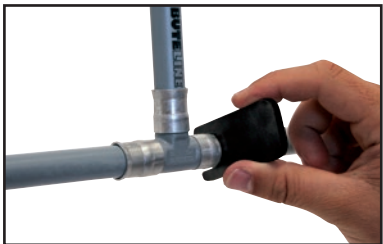


2. Insert the pipe into the Buteline fitting. Ensure you push the pipe all the way (15mm) into the shoulder of the fitting, up to the next indicator line of the same size.



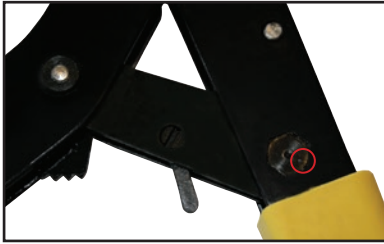
3. *Clamp-Hold-Release*

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.

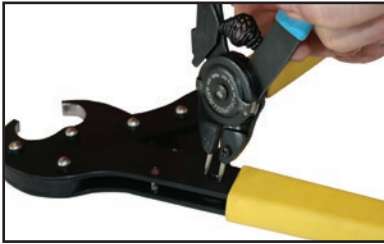


4. Use the gauge provided to check that the full clamp force has been achieved. If the gauge does not pass over the ring, the ring is under-clamped. It is important that the gauge passes over the clamp ring. Take corrective action by re-adjusting the tool (see pages 20 & 21) and then re-clamping.

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 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



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

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

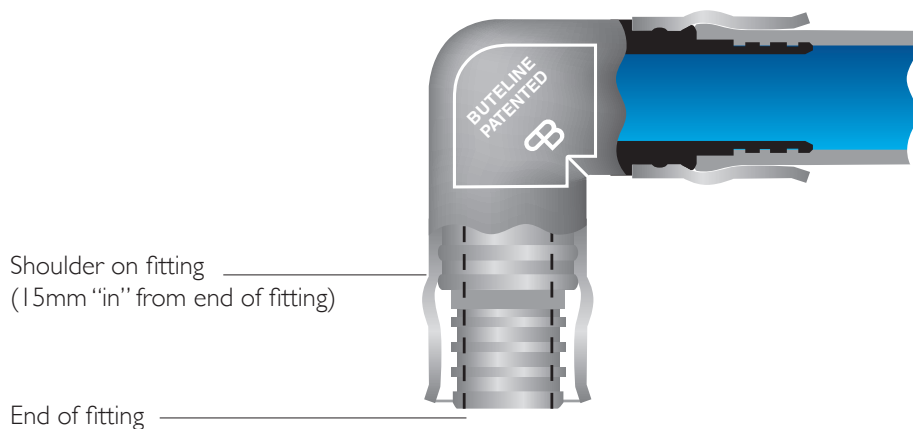
Preparation Of Pipe

- (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.

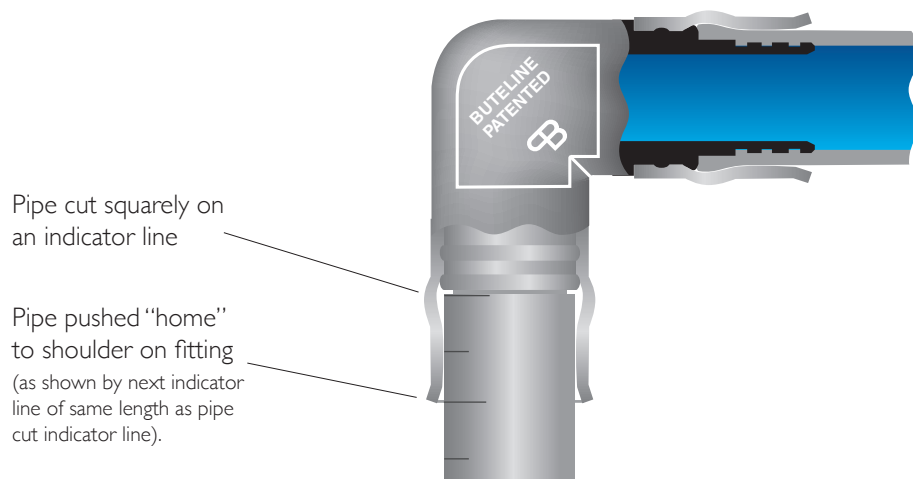


Position Of Fittings

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



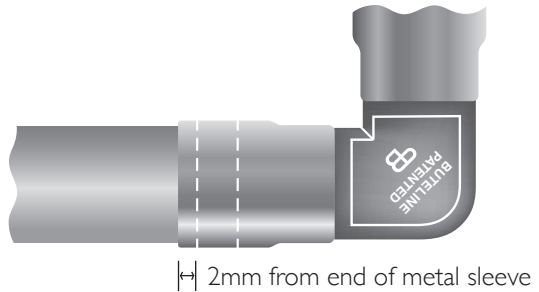
- (b) Fully insert (push home to shoulder) the pipe into Buteline fittings, up to the next indicator line of the same size to ensure full engagement of the pipe into the fitting.



Clamping Buteline Fittings

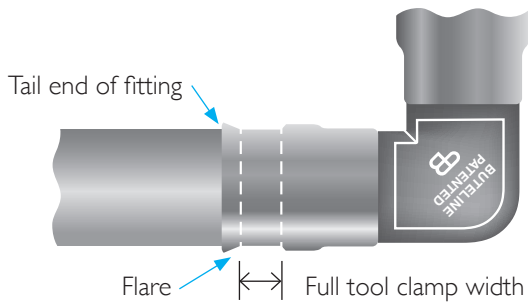
- (a) Position the Buteline clamp tool squarely and approximately 2mm in from the end of the factory fitted reinforcing clamp ring.

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

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

- (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

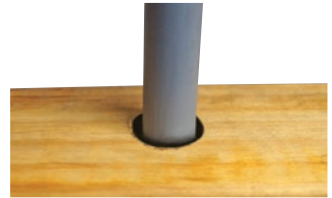
Use 24mm drills for – PB-1 Type 22 (22mm O.D.) Class 16 pipe

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 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 |
|--|------------------------|
| 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.) PNI 6 Recycled Water / Rainwater Pipe | 300mm |

Pipe Clipping

There are 2 types of Buteline pipe clips available:



Timber / masonry clip



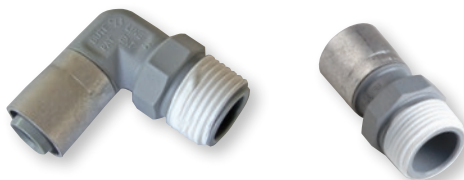
Metal framing screw clip

NOTE:
Remember that Buteline PB-I 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-I | 600mm | 1200mm |
| Type 22 PB-I | 700mm | 1400mm |
| Type 28 PB-I | 750mm | 1500mm |
| PE20 (20mm O.D.) PNI 6 | 700mm | 1400mm |

Buteline Polymer Threaded Connections

- (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.
Hand tighten plus a ½ turn.



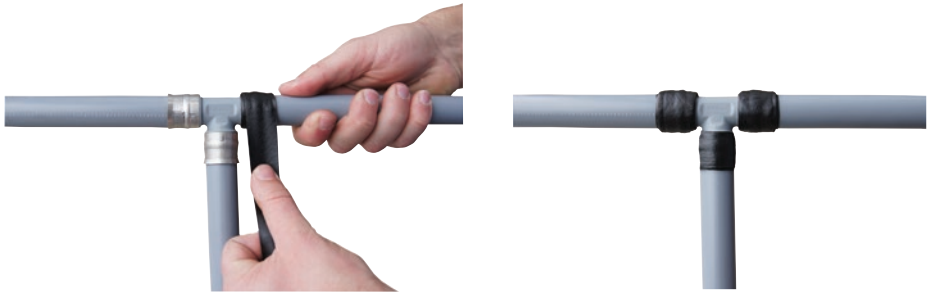
Buteline Swivel Connections

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

- (a) If 'jointing' underground is necessary, wrap the aluminium rings directly to create a waterproof membrane. A suitable tape like Denso tape or PVC insulation tape is correct and the rings should be completely wrapped as shown.



- (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 Denso tape or PVC insulation tape
(shown as point (a) of page 30).

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

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

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-I 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-I 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-I 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-I | 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.

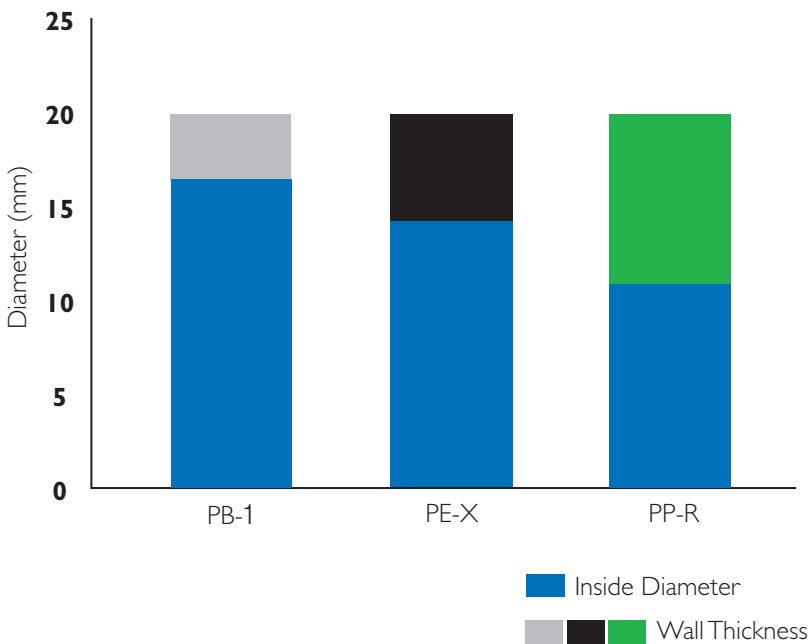
Wall Thickness & Design Stress

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

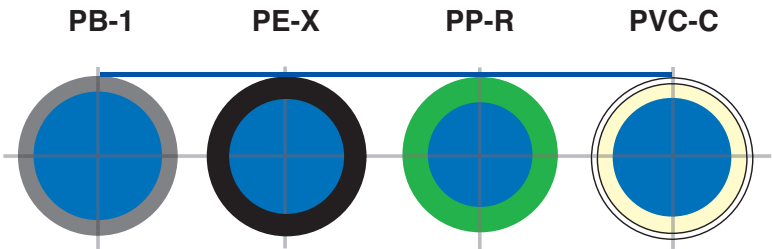
Lower wall thickness also means a larger internal bore for a given external pipe diameter, resulting in reduced head pressure loss and lower flow speeds to deliver a fixed volume of water.

A comparison of the inside diameter / thickness of Polybutene-I (PB-I) 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-I pipe.

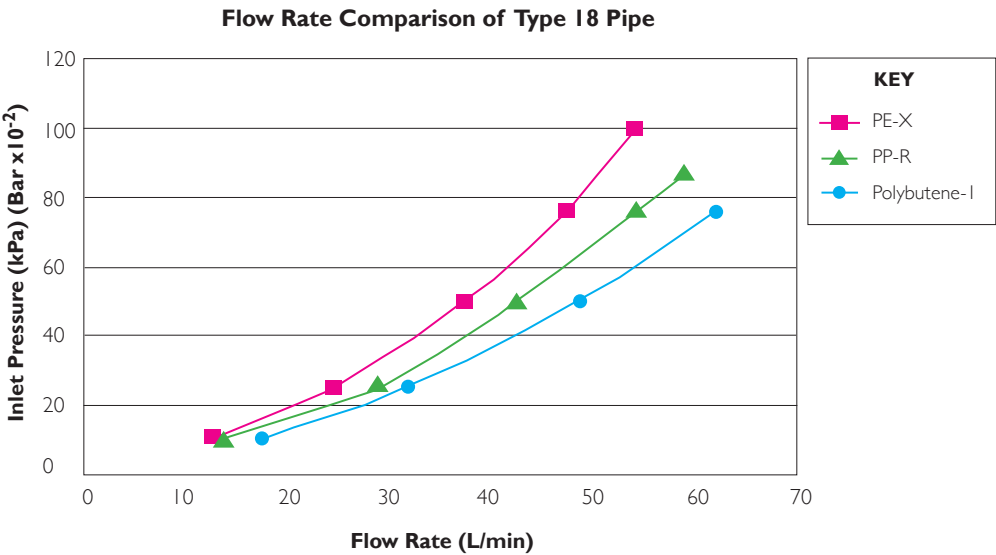
Internal Diameter of Buteline Pipe

| 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 |

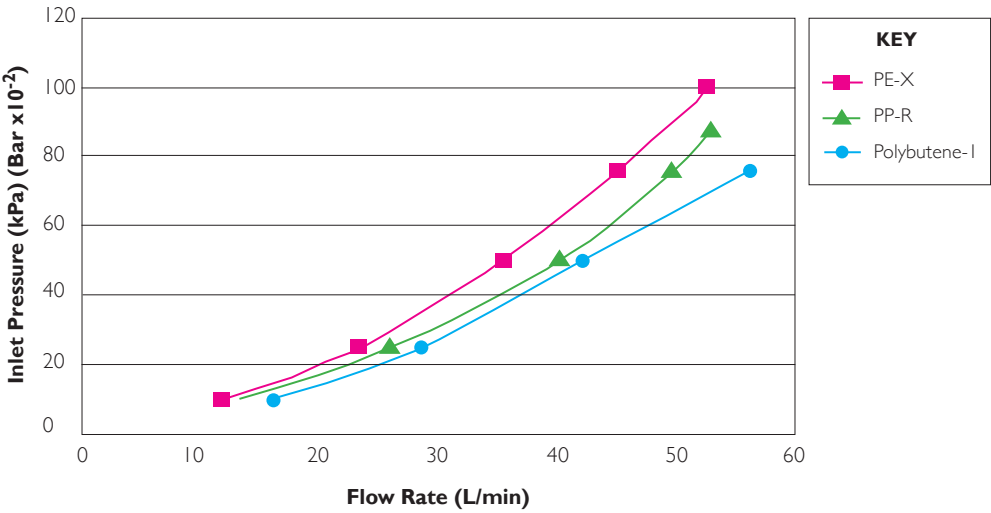
Flow Rate Comparisions: Polybutene-1 vs PE-X vs PP-R

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).

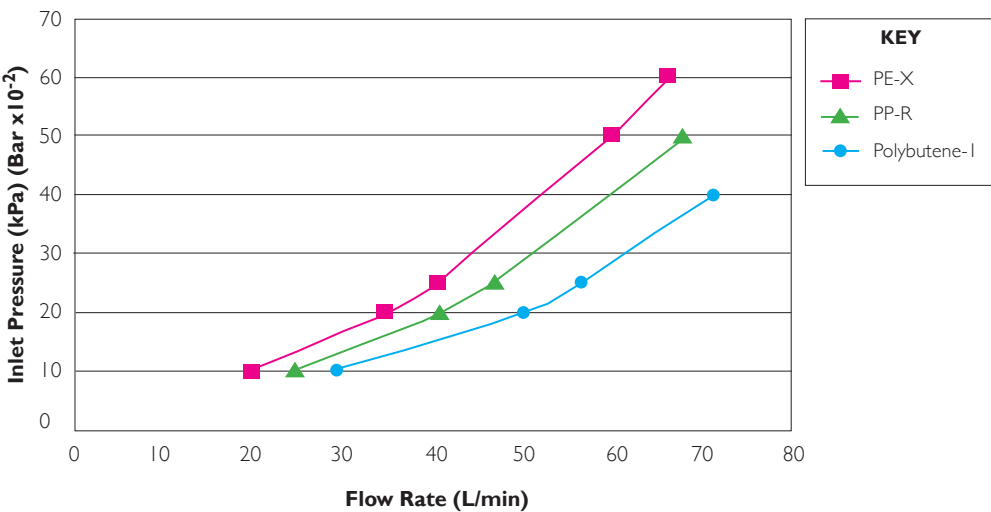
You will note that Polybutene-1 performs much better than both PE-X and PP-R.

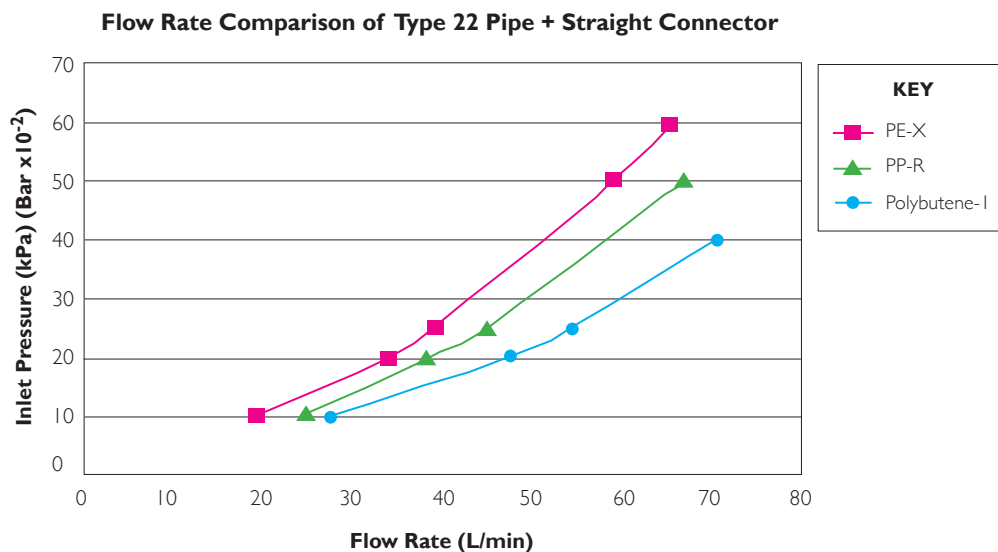


Flow Rate Comparison of Type 18 Pipe + Straight Connector



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-I (PB-I) pipe is 50 years and longer according to permissible working pressure / temperature.

Buteline Class 16 PB-I 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-I 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-I 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 | P.S.I. |
| 20 | 1600 | 232 |

Buteline Pipe Pressure Head Loss

| Minimum Flow Required / min | | Pressure / Head Loss Per 30 Metres (100 Feet) of Pipe | | | | | | | | | |
|--------------------------------|---------|---|--------|--------------|--------|--------------|--------|-------------|--------|--|--|
| | | PB-1 Type 18 | | PB-1 Type 22 | | PB-1 Type 28 | | PE20 - PN16 | | | |
| | | kPa | P.S.I. | kPa | P.S.I. | kPa | P.S.I. | kPa | P.S.I. | | |
| Litres | Gallons | | | | | | | | | | |
| 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 | | |

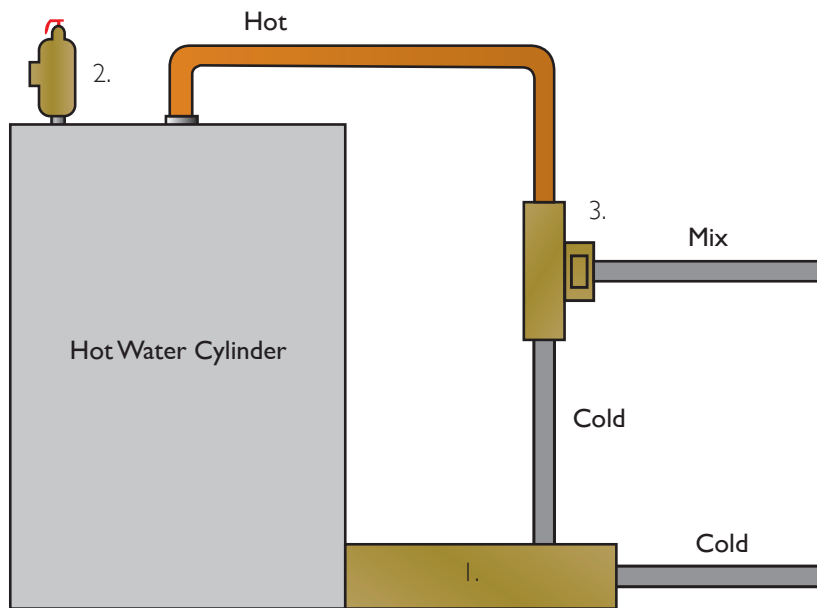
Please refer to page 52 for a Pressure Conversion Chart.



Hot Water Installations

- (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

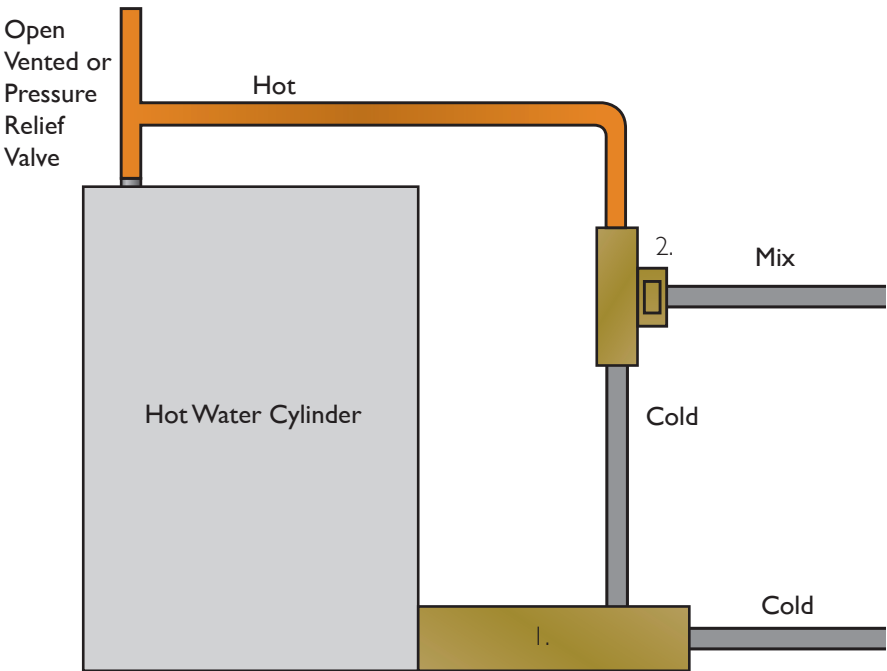




Buteline PB-I Pipe 
Copper Pipe (minimum 1m) 

- 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

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-I pipe for solar heater-to-cylinder plumbing.

Installation Checklist

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

Test The Installation

- (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

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

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 (leaving at least 25mm of pipe to fitting, where possible) 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

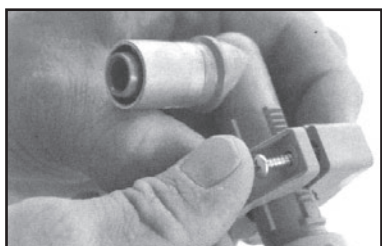
Pipe Out Stage



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).



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

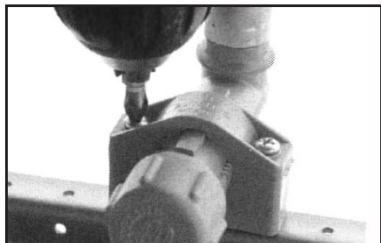


3. Assemble the Bute-1 by following the instructions enclosed in the box, clicking it together and then pushing the supplied screws through the holes to hold the assembly together. Then screw the assembled fitting to the brace.

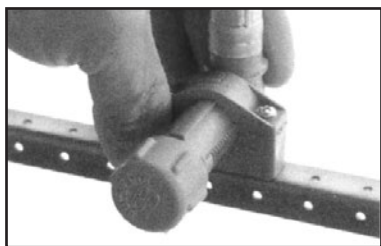


Watch online on YouTube at the following web addresses:

- Bute-1 Video: tinyurl.com/bute1info
- Buteline Metal Framing Bracket Installation Video: tinyurl.com/MFB1install

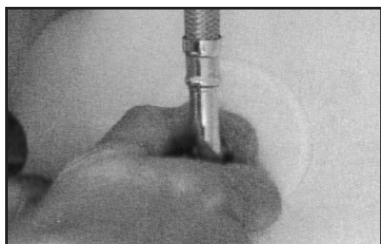


4. Tighten (nip) the Bute self-sealing protective test cap with the Bute palm spanner supplied. (No washers or thread tape etc. required). Fit pipe and clamp.



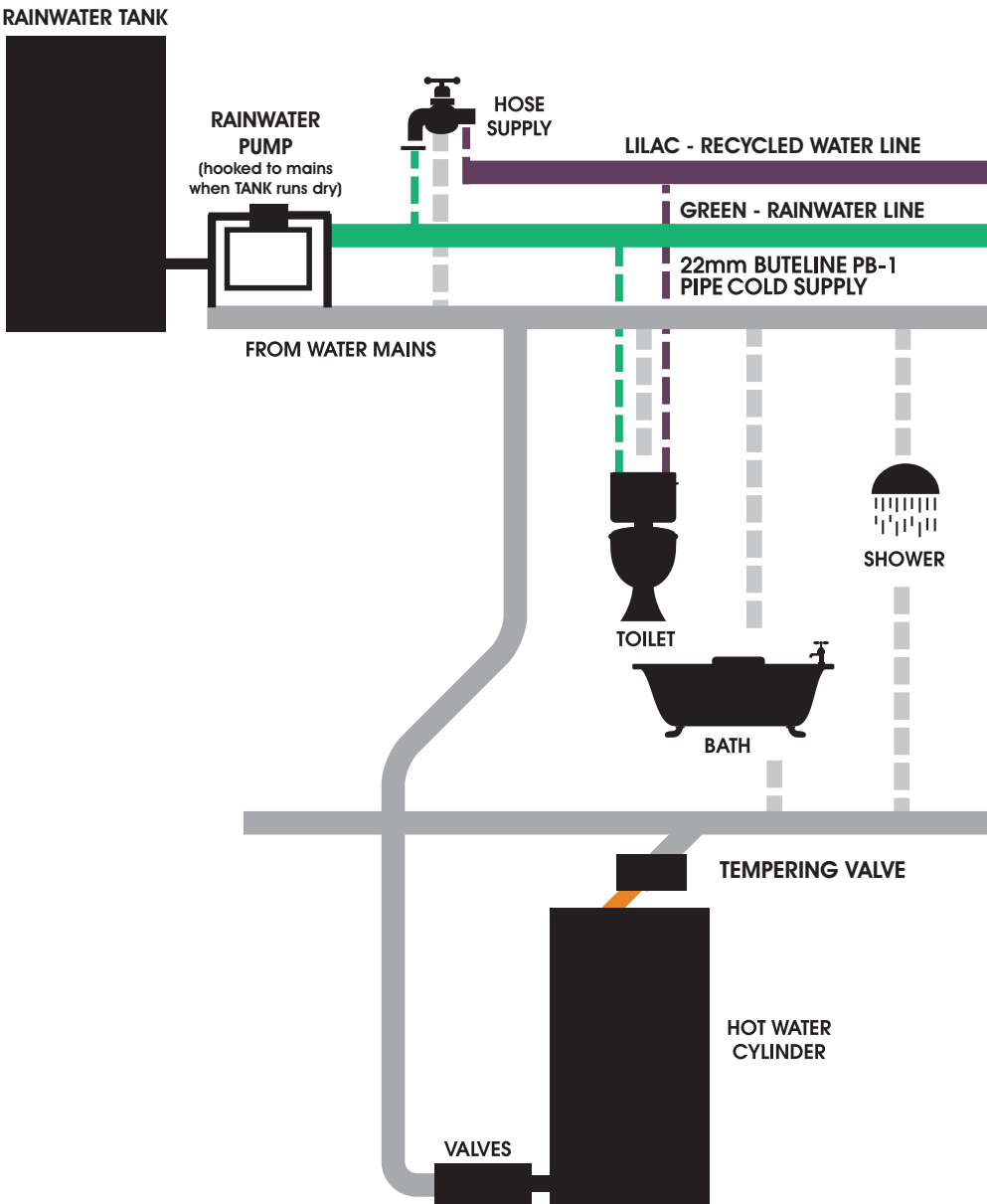
5. Pull the Bute-I fitting into the fully forward position.

Fit Off Stage

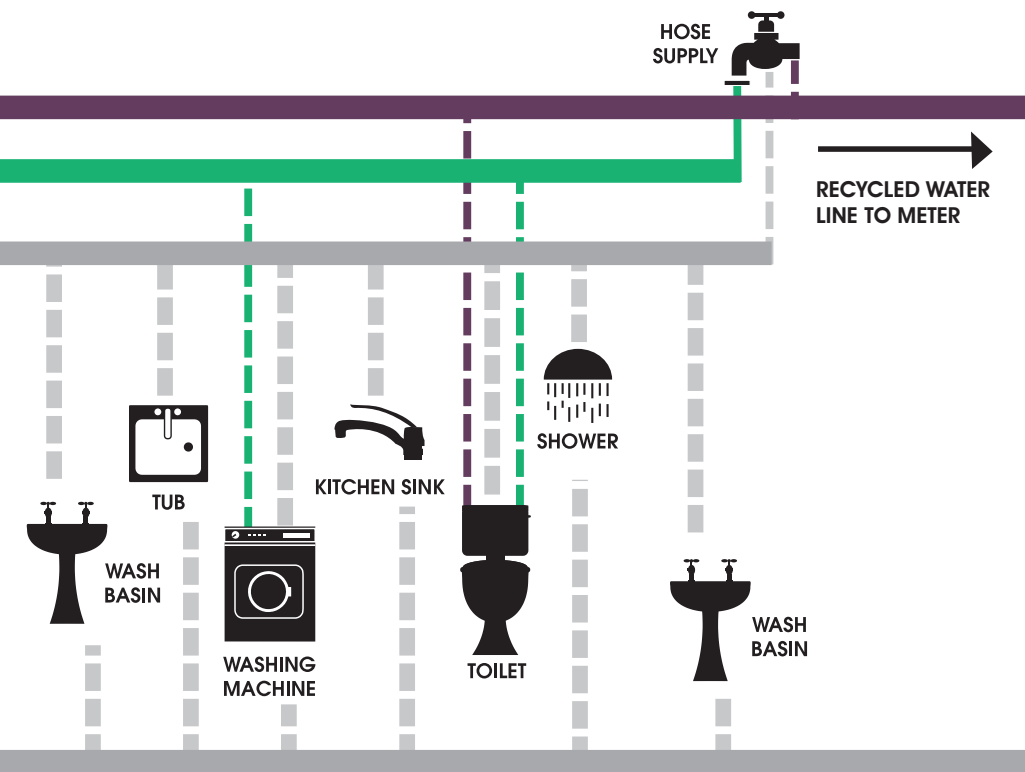


1. Remove the Bute self-sealing protective test cap with the Bute palm spanner and drain.
2. Fit wall flange (if necessary) and then connect the appropriate fitting and do not overtighten.
3. Push back the Bute-I until contact is made with the wall lining.

Typical Method of Plumbing



Using Buteline PB-1 Water Mains As Shown



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. 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

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.

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BUTELINE AUSTRALIA PTY LTD

Freecall: 1800 146 535. Freefax: 1800 146 551

sydney@buteline.com.au

ABN: 51 084 154 129