BUTELINE™
PLUMBING SYSTEM

Company & System Overview

Buteline Malaysia Sdn Bhd

www.buteline.com

Company Overview

The Buteline Group is a modern and successful plumbing system manufacturing company that produces one of the most popular and reliable reticulation systems available. Buteline has won acclaim for innovation and advanced design. Their commitment to excellence is built into every product produced in their advanced manufacturing facilities in Nilai, Negeri Sembilan and Auckland, New Zealand.

The success of Buteline is due to their commitment to produce all system components to consistently high engineering standards and tolerances, along with providing a quick and simple method of clamping joints on-site. This means components can be efficiently and consistently assembled to ensure the system offers its users rapid installation and long reliable service.

To consistently achieve these high standards, Buteline conducts all of its product research and development work within the group. All of the tools and dies required for manufacturing the Buteline Plumbing System are produced by the group's own tool making division.

The infinite care and attention that went into developing the Buteline brand as an efficient and reliable long-life plumbing system is the prime reason behind their continuing growth and expansion, along with their strong performance record.

An ISO 9001 company, Buteline has installed in-house test equipment to give both quality assurance and quality control of production. These facilities, combined with a strong commitment to continuing research and development, will ensure that Buteline remain a world leader in plumbing system technology.

System Overview

The Buteline Plumbing System is designed for hot and cold water reticulation using Polybutene-1 (PB-1) pipe, or for cold water only using Polyethylene (PE100) pipe, Buteline always represents quality and only selects materials which are specifically designed for their applications. Both PB-1 and PE systems utilise Buteline's proven and efficient clamping technique, and offer all the Buteline benefits with their respective cost advantages.

The Buteline Plumbing System is manufactured to conform to many international standards and approvals, but specifically complies with the following:

- ✓ SPAN Approval (Product Registered with Suruhanjaya Perkhidmatan Air Negara)
- ✓ ISO Standard ISO 14236
- ✓ Malaysian Standard MS 1058 (PE pipe)
- ✓ Australia / New Zealand joint standard AS/NZS 2642
- ✓ Australia / New Zealand joint standard AS/NZS 4129/4130
- ✓ WaterMark AS/NZS 2642
- ✓ United Kingdom British standard BS 7291

Made In Malaysia

SPAN
Suruhanjaya Perkhidmatan Air Negara
NO. SIJIL PENDAFTARAN: SPAN / KP / A / 00260-2008
SPAN / KP / A / 00261-2008
SPAN / KP / A / 00262-2008
SPAN / KP / A / 00263-2008

MS
SIRIM

Quality System
Quality Endorsed Company
ISO 9001: 2008
LIC QEC 20721
Standards Australia

Certified Product
Australian Standard
AS/NZ 2642 LIC 1639
LIC 1640
Standards Australia

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

WRAS APPROVED PRODUCT
0510076

The Buteline Fitting

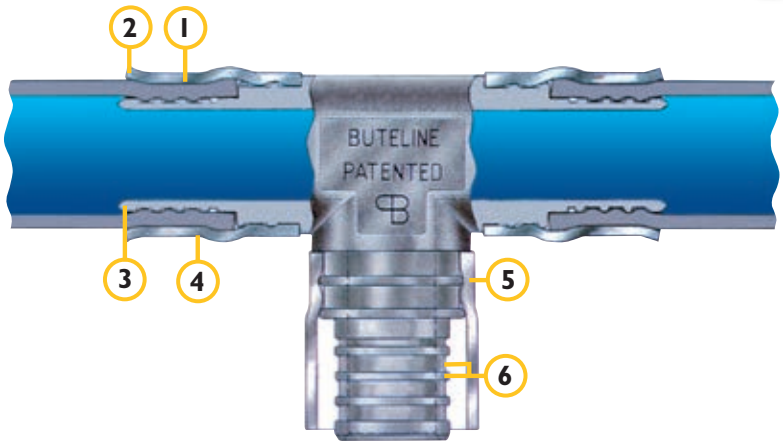
Buteline has developed an extensive range of quality fittings for Polybutene-1 and Polyethylene pipes. Buteline fittings are moulded from thermoplastic and fitted with an annealed protective aluminium alloy sleeve, attached during manufacture, to provide a unique metal reinforced joint.

This is where Buteline's design stands out, the fitting design overcomes high stresses, experienced in installation and service on the tail section of the fitting, by transferring all loads applied through the pipework to the thicker body of the fitting, minimising any risk of failure.

During on-site installation of the fitting, the metal sleeve ensures the correct clamping position away from the end of the pipe which maximises resistance to pull out. The Buteline Group has produced millions of these thermoplastic fittings and after many years of service, they continue to work successfully.

Key Advantages

- ✓ Manufactured from modern high-performance polymers
- ✓ Lightweight and user-friendly
- ✓ Able to provide metal-free contact with water supply
- ✓ Corrosion resistant, no scale build-up
- ✓ One piece design, no additional parts
- ✓ Provides a visual indicator of joint completion
- ✓ Proven high and low temperature pressure
- ✓ Time proven leak-proof joint



1 8mm 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 RINGS
Narrow lands with wide grooves, ensure clamp stress is transferred into the pipe joint efficiently.

The Buteline Pipe

Buteline manufactures pipes in various sizes up to and including 32mm from two materials.

Polybutene-1 (PB-1)

Polybutene-1 was developed over 30 years ago for use as hot and cold water plumbing pipe material and is a proven solution for the conveyance of clean healthy drinking water. With superior temperature and thermal capabilities compared to other materials, it endures and continues to perform both in low and high temperature applications. The flexibility of Polybutene-1 pipe assists installers and eliminates water hammer noise. Polybutene-1 is also environmentally friendly as it is 100% recyclable.

Buteline produces lengths of Polybutene-1 pipe in a variety of sizes ranging from 18mm to 28mm.

Polyethylene (PE100)

Polyethylene is accepted worldwide as one of the preferred materials for the transport of potable water, and has been in service for over 50 years. Buteline has adopted Polyethylene (HDPE) as a cost effective alternative plumbing material for cold water only installations.

Buteline produces lengths and coils of Polyethylene pipe in a variety of sizes ranging from 20mm to 32mm.

Manufacturing coils on the Buteline Pipewinder

The pipe extrusion process

The pipe is manufactured on Buteline equipment, designed and built by Buteline's equipment division. It has the capability to run straight 5 metre lengths of pipes and to automatically cut quality assurance samples, ensuring pipe quality is monitored and maintained throughout manufacture.

Buteline's manufacturing equipment and technology ensure the production of consistently high quality pipe. Combined with Buteline's laboratory testing, this ensures that all pipe exceeds even the most stringent world standards.

Technical Data

Polybutene-1 (PB-1)

As a material, Polybutene-1 (PB-1) is technically preferred for the manufacture of piping for reticulating hot and cold potable water systems, as it has many advantages over traditional and competitive materials. PB-1 resins are flexible, linear polyolefins offering a unique combination of properties.

The most important commercial application for Polybutene-1 (PB-1) is in plumbing pipe for residential and commercial use.

Buteline sources all Polybutene-1 (PB-1) granules of optimal quality from Basell (www.basell.com).

Basell is acknowledged as the world's leading Polybutene-1 (PB-1) polymer manufacturer.

Key Advantages of Polybutene-1:

- ✓ Excellent resistance to creep
- ✓ Extremely high strength (high yield strength, high impact strength, high tear strength, high puncture resistance)
- ✓ Exceptional resistance to environmental stress cracking
- ✓ No corrosion
- ✓ Low noise transmission
- ✓ Pigmented against algae formation
- ✓ Low thermal conductivity
- ✓ Withstands many freeze / thaw cycles
- ✓ Larger pipe internal diameter resulting in better pipe hydraulics
- ✓ Low pipe weight

Application: Potable HOT & COLD water

Compliant with:
Pipes – Australia / New Zealand joint standard AS/NZS 2642.2
Fittings – Australia / New Zealand joint standard AS/NZS 2642.3

Size	OD	WT	ID	Length
18mm (½")	15.95mm	1.64mm	12.67mm	5.0m
22mm (¾")	22.25mm	2.14mm	17.97mm	5.0m
28mm (1")	28.08mm	2.80mm	22.48mm	5.0m

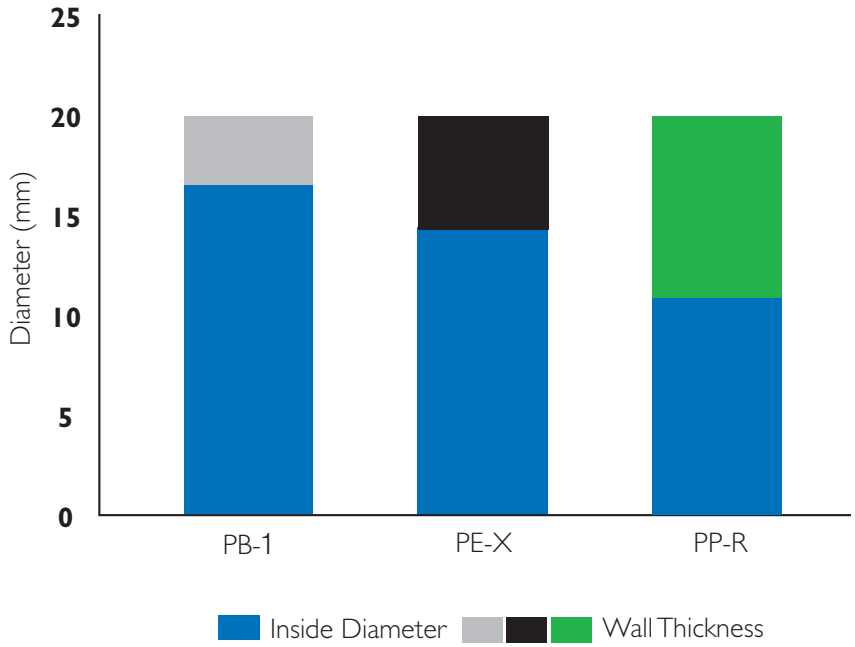
Working Pressure:	1600 kPa (230 PSI) at 20°C	740 kPa (107 PSI) at 80°C
Hydrostatic Design Stress:	7.6 mPa (1100 PSI) at 20°C	3.5 mPa (507 PSI) at 80°C
Density:	0.93 g / cm^3 at 25°C	
Melting Point:	124 - 126°C	
Thermal Conductivity:	0.18W / M per °C	
Expansion Rate:	0.13mm / °C	

Diameter and Wall Thickness

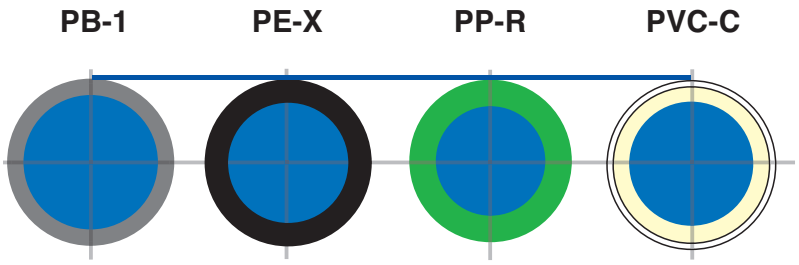
Due to the properties of Polybutene-1 (PB-1) raw material, Polybutene-1 (PB-1) piping can achieve high temperature and high stress but maintain lower wall thickness to ensure adequate water-flow through the pipe network.

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.

Polyethylene (PE100)

Characterized by toughness, near-zero moisture absorption, excellent chemical resistance, excellent electrical insulating properties, low co-efficient of friction and ease of processing, Polyethylene has been an accepted material for the production of fittings and pressure pipes used in the distribution of drinking water for more than 50 years.

Due to its molecular structure, Polyethylene exhibits extremely good strength at room temperatures whilst retaining its flexibility and has longevity of life when used for cold water plumbing applications.

Buteline PE fittings are manufactured from UV-stabilized engineering polymer which are immune to scale build-up, provides good resistance to creep, as well as resistance to a large range of chemicals.

Buteline PE pipes have a blue stripe for easy identification of their application for cold potable water.

Key Advantages of Polyethylene

- ✓ More flexibility is offered with PE pipe than metal, PVC or ABS pipes used for similar applications
- ✓ Immunity to scale build-up associated with conventional metal pipes
- ✓ Good chemical resistance and high resistance to most household chemicals
- ✓ Excellent impact resistance, even at low temperatures
- ✓ High tensile strength when used for conveying cold water

Application: Potable COLD water

Compliant with:
Pipes – Malaysian standard MS 1058: Part 2, Australia / New Zealand joint standard AS/NZS 4129/4130
Fittings – ISO standard 14236

Size	OD	WT	ID	Length	Working Pressure at 20°C
20mm (½")	20.15mm	2.4mm	15.35mm	5.0m / 50m	2000 kPa
25mm (¾")	25.15mm	2.4mm	20.35mm	5.0m / 50m	1600 kPa
32mm (1")	32.15mm	3.0mm	26.35mm	5.0m / 50m	1600 kPa

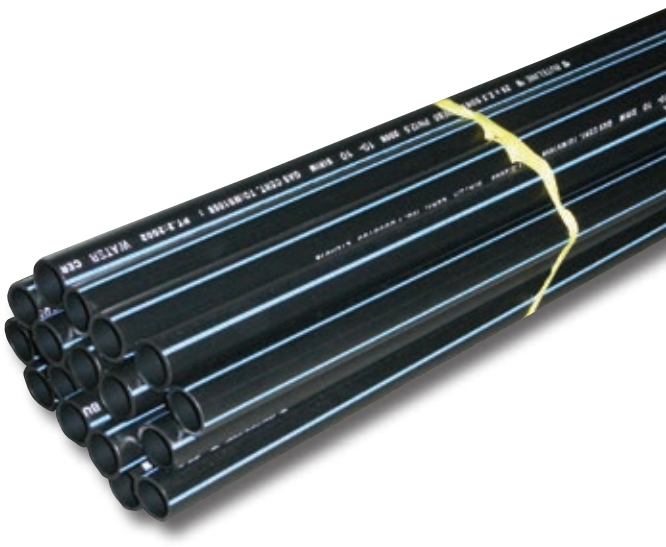
Hydrostatic Design Stress: 5.4 MPa (785 PSI) at 20°C

Density: 0.955 g/cm^3 at 25°C

Vicat Softening: 116°C

Thermal Conductivity: 0.4 W / M per °C

Expansion Rate: 0.26mm / °C



The Buteline Clamp Tool

Vital to the efficiency of a plumbing system is the ability to consistently clamp fittings securely.

Buteline has engineered their clamp tool to ensure a simple, secure and watertight joint every time.

The specially designed and patented Buteline clamp tool has a head that produces a round 'seam free' clamp. The head is made from case hardened parts to ensure long trouble-free life.

With the Buteline clamp tool there is no need for adjustment or calibration and a variety of sizes are available to suit Buteline fittings.

Key Advantages

- ✓ Extremely easy to maintain – simply clean and lubricate moving parts regularly.
- ✓ Operation of the Buteline clamp tool is possible with a single hand.
- ✓ Well thought-out design ensures problem-free clamping of joints every time, even in those hard-to-get situations, with reduced incidence of 'angled clamping'.
- ✓ Positive stop for clamping action ensures that the correct clamping force is applied to the joint every time, without requiring judgment on the part of the operator. This feature guarantees that Buteline fittings will not be overstressed by the application of too much clamping force when making a joint.

1. Ensures an accurate, watertight joint
2. Ease of grip: simply push together for a controlled, consistent clamp
3. Stops

BUTE - PE System for Cold Water Services (HDPE) Pipe Fitting Part Numbers and Description

PART	PRODUCT	CODE	DESCRIPTION 1 2 3
Tee		TE666 TE777 TE999 TR776 TR766 TR767 TR996 TR997 TR977 TR979	20 x 20 x 20 25 x 25 x 25 32 x 32 x 32 25 x 25 x 20 25 x 20 x 20 25 x 20 x 25 32 x 32 x 20 32 x 32 x 25 32 x 25 x 25 32 x 25 x 32
Elbow		EE66 EE77 EE99 ER76 ER96 ER97	20 x 20 25 x 25 32 x 32 25 x 20 32 x 20 32 x 25
Elbow Male		EM6B EM7B EM6C EM7C EM9C EM9D	1/2" BSPT x 20 1/2" BSPT x 25 3/4" BSPT x 20 3/4" BSPT x 25 3/4" BSPT x 32 1" BSPT x 32
Elbow Female Swivel		EF6B EF7B EF6C EF7C EF9C EF9D	1/2" BSPT x 20 1/2" BSPT x 25 3/4" BSPT x 20 3/4" BSPT x 25 3/4" BSPT x 32 1" BSPT x 32
Tee Male		TM66B TM77C TM99C	1/2" BSPT x 20 x 20 3/4" BSPT x 25 x 25 3/4" BSPT x 32 x 32
Barrel Nipple		BN421 BN422 BN423	(In Grey Colour Only) 1/2" x 1/2" BSPT 1/2" x 3/4" BSPT 3/4" x 3/4" BSPT

BUTE - PB System for Hot and Cold Water Services
(PB) Pipe Fitting Part Numbers and Description

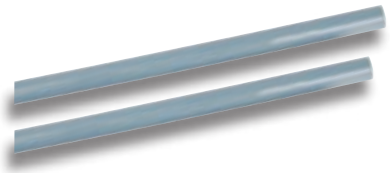
PART	PRODUCT	CODE	DESCRIPTION
Pipe Clip		PC433	(In Grey Colour Only) For 20 (1/2") Pipe
Straight Inline Coupling		SE66 SE77 SE99 SR76 SR96 SR97 SE98	20 x 20 25 x 25 32 x 32 25 x 20 32 x 20 32 x 25 32 (3.0mm) x 32 (2.4mm)
Tank Connector Male		SMTC7C SMTC9D	3/4" BSPT x 25 1" BSPT x 32
Elbow Lugged		EFL6B	1/2" BSPT x 20
Straight Male		SM6B SM7B SM6C SM7C SM9C SM9D	1/2" BSPT x 20 1/2" BSPT x 25 3/4" BSPT x 20 3/4" BSPT x 25 3/4" BSPT x 32 1" BSPT x 32
Straight Female Swivel		SF6B SF7B SF6C SF7C SF9C SF9D	1/2" BSPT x 20 1/2" BSPT x 25 3/4" BSPT x 20 3/4" BSPT x 25 3/4" BSPT x 32 1" BSPT x 32

PART	PRODUCT	CODE	DESCRIPTION
Straight Hose Plate		SFL6B	1/2" BSPT x 20
Fitting Plug		FPB	1/2" BSPT
Pipe End Plug		PEP6 PEP7 PEP9	20 (1/2") 25 (3/4") 32 (1")
Bute PE Pipe		HE20 HE25 HE32 HEC20 HEC25 HEC32	DN20mm x PN20 DN25mm x PN16 DN32mm x PN16 DN20mm x PN20 DN25mm x PN16 DN32mm x PN16
Bute Clamp Tool		CT6 CT7 CT8	20mm 25mm 32mm
Bute Cutter		PB491	Universal

BUTE - PB System for Hot and Cold Water Services
(PB) Pipe Fitting Part Numbers and Description

PART	PRODUCT	CODE	DESCRIPTION 1 2 3
Tee		T302 T304 T305 TR324 TR328 TR329 TR330 TR334 TR336 TR337	18 x 18 x 18 22 x 22 x 22 28 x 28 x 28 18 x 18 x 22 22 x 22 x 18 22 x 18 x 18 22 x 18 x 22 28 x 28 x 22 28 x 22 x 28 28 x 28 x 18
Elbow		E202 E204 E205 ER224	18 x 18 22 x 22 28 x 28 28 x 22
Elbow Male		EM262 EM264 EM273 EM274 EM275	1/2" BSPT x 18 1/2" BSPT x 22 3/4" BSPT x 22 3/4" BSPT x 28 1" BSPT x 28
Elbow Female Swivel		EF242 EF244 EF253 EF254 EF255	1/2" BSPT x 18 1/2" BSPT x 22 3/4" BSPT x 22 3/4" BSPT x 28 1" BSPT x 28
Tee Male		TM362 TM364 TM365	1/2" BSPT x 18 x 18 1/2" BSPT x 22 x 22 3/4" BSPT x 18 x 18
Barrel Nipple		BN421 BN422 BN423	(In Grey Colour Only) 1/2" x 1/2" BSPT 1/2" x 3/4" BSPT 3/4" x 3/4" BSPT

PART	PRODUCT	CODE	DESCRIPTION
Pipe Clip		PC432 PC434	(In Grey Colour Only) For 18 (1/2") Pipe For 22 (3/4") Pipe
Straight Inline Coupling		S102 S104 S105 SR123 SR125	18 x 18 22 x 22 28 x 28 22 x 18 28 x 22
Tank Connector Male		TCM193	3/4" BSPT x 22
Elbow Lugged		EL282 EL284	1/2" BSPT x 18 1/2" BSPT x 22
Straight Male		SM162 SM164 SM171 SM173 SM174 SM175	1/2" BSPT x 18 1/2" BSPT x 22 3/4" BSPT x 18 3/4" BSPT x 22 3/4" BSPT x 28 1" BSPT x 28
Straight Female Swivel		SF143 SF145 SF151 SF153 SF154 SF155	1/2" BSPT x 18 1/2" BSPT x 22 3/4" BSPT x 18 3/4" BSPT x 22 3/4" BSPT x 28 1" BSPT x 28

PART	PRODUCT	CODE	DESCRIPTION
Straight Hose Plate		SFL182	1/2" BSPT x 18
Fitting Plug		FP412	1/2" BSPT
Pipe End Plug		PEP402 PEP404 PEP405	18 (1/2") 22 (3/4") 28 (1")
Bute PB Pipe		BL18 BL22 BL28	DN18mm x PN16 DN22mm x PN16 DN28mm x PN16
Bute Clamp Tool		CT482 CT484 CT485	18mm 22mm 28mm
Bute Cutter		PB491	Universal

Installation Guide Overview

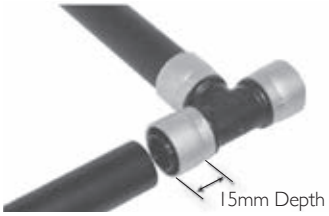
It is imperative to use ONLY the complete Buteline Plumbing System:

- ✓ Buteline PB-1 pipes with Buteline PB-1 fittings and Buteline PB-1 clamp tools
- ✓ Buteline PE pipes with Buteline PE fittings and Buteline PE clamp tools
- ✓ Buteline pipe cutter

Because:

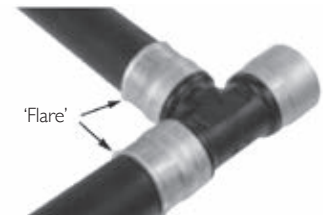
- ✓ Use of other material within the system may lead to failure.
- ✓ Buteline pipes and fittings are manufactured to higher tolerances
- ✓ Damage resulting from failure to adhere to the guidelines as described below will be at the responsibility of the installer.

Step 1.Cut the pipe to length squarely and cleanly using the Buteline pipe cutter.



Step 2. Fully insert the pipe into the Buteline fitting.

Step 3. Position the clamp tool squarely and approximately 2mm from the edge of the factory fitted reinforcing ring.



Step 4. Close clamp tool handles completely. A good clamp will produce a 'flare' at the end of the reinforcing ring.

Step 5. When burying Buteline fittings underground or in concrete (eg: behind a wall), wrap the aluminium rings with Scapa self-amalgamating tape (or Denso tape or similar) to ensure the longevity of your favourite plumbing system.

Guidelines to Installing the Buteline Plumbing System

- Cut Buteline PB-1 or Buteline PE pipe squarely using a Buteline pipe cutter.
- Ensure that the pipe is clean before inserting it into the fitting.
- Use pipe thread tape on all Buteline threaded fittings.

NOTE: When connecting the Buteline female swivel fittings to male threads, the end face of the male thread must be square with the thread axis and must be smooth and free of notches, dents or saw marks.

✓ Buteline pipes should be installed ensuring any bending radius is NOT less than:

- Buteline PB-1 pipes 10 x OD
- Buteline PE pipes 12.5 x OD

✓ Sharp bends should be made with appropriate Buteline fittings.

✓ Bored holes through concrete should be large enough to allow free movement of pipe.

✓ Buteline pipe can be buried in concrete.

✓ Buteline pipe which penetrates fire resistant construction must be installed to ensure the fire resistant integrity of the building is retained.

✓ **When burying Buteline fittings underground, or behind a wall, wrap the aluminium rings with tape to prevent corrosion.**

For installation of the water mains:

✓ The trench should be as straight as possible between the water meter and the house connection.

✓ Lay Buteline PE pipe at the bottom of the trench.

✓ Check that there are no sharp objects that may cut or damage the pipe.

✓ 'Snake' the pipe to allow for expansion and contraction.

PB-1 installations should have a minimum of 1 metre of copper tube from the hot water cylinder. When using a tempering valve, use Buteline PB-1 pipe direct from the mixing outlet.

For more information, please refer to the Plumbers Technical and Installation Manual – FREE on request.

Project References

Internationally, there is high demand for the Buteline Plumbing System. As a result, the System has been installed in numerous residential housing and commercial projects throughout the world.

For more project references please visit www.buteline.com

Bandar Sri Sendayan
Negeri Sembilan, Malaysia

Mira Residence
Penang, Malaysia

Kemuning Utama
Shah Alam, Selangor, Malaysia

Spring Heights Nilai
Negeri Sembilan, Malaysia

Unipark Bangi
Selangor, Malaysia

** For information regarding Buteline warranties and guarantees please refer to the contact details applicable to your region located on the back cover.*

Disclaimer

This manual is only a general guide to the Buteline Plumbing System and cannot take into account the different circumstances of every application. We provide the information in this manual on the understanding that you will obtain professional advice and assistance before proceeding with any installation of our products. 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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