

# Technical Manual





Committed to sustainable development, Philmac is well renowned for quality products and services. Philmac manufactures pipe fittings and valves under a Quality Assurance System assessed and approved to ISO 9001-2000 and has obtained the prestigious environmental management certification ISO 14000. Philmac has a NATA accredited laboratory and tests fittings and valves to international and national standards. Third party accreditation is carried out by SAI Global.

## CONTENTS

<b>Introduction</b>	<b>2</b>
<b>Benefits</b>	<b>2</b>
<b>Standards</b>	<b>3</b>
<b>Installation Instructions – Metric</b>	<b>4</b>
<b>– Poly to Copper</b>	<b>5</b>
<b>System Design Considerations</b>	<b>6</b>
<b>Materials &amp; Components</b>	<b>7</b>
<b>Applications</b>	<b>7</b>
<b>Product Specifications</b>	<b>8</b>
<b>Principals of Operation</b>	<b>9</b>
<b>Projected Life of Compression Fittings</b>	<b>10</b>
<b>Range Dimensions &amp; Weights</b>	<b>11</b>



### Disclaimer

Please note that the information, opinions, recommendations and advice given in this manual are supplied only to provide an improved understanding of the technical aspects of fitting systems.

So far as the law allows, Philmac Pty Ltd will not accept liability in respect of any loss or damage of any kind claimed to arise as a result of reliance upon any information claimed in this manual.

Please refer to our Terms and Conditions of sale.

## INTRODUCTION

Philmac's Metric compression fitting revolutionises PE pipe joining technology. Built on Slide & Tighten™ technology, connecting PE pipe has never been faster or easier.

Philmac's unique Slide & Tighten™ technology means that pipe preparation and loose components become a thing of the past. Simply slide the pipe into the fitting and tighten the nut to the flange. It's really that easy.

The Philmac Metric compression fitting is made from advanced thermoplastic materials providing a high degree of corrosion and UV resistance. The material is also lightweight and is completely non-toxic and taint free. Rated to 1600kpa and providing a greater than 50 year design life, Philmac's Metric compression fitting is designed to handle the most demanding conditions.

Designed to make the job at hand so much easier, the Metric fitting is the product of Philmac's unrelenting commitment to continuous improvement and a culture based on innovation and ingenuity.

## BENEFITS

### Fast and Easy Installation

**Slide & Tighten™ technology:** Philmac Metric incorporates all the benefits of Philmac's Slide & Tighten™ technology. Simply insert the pipe until the first point of resistance is felt, and then tighten the nut up to the flange of the fitting body. No pipe preparation is needed and no force is required to push the pipe past the seal, so installation couldn't be faster or easier. The advantage becomes even more significant in the larger sizes due to the cumbersome nature of large diameter pipes.

**Easy Disassembly:** The fitting has been designed so that the once the nut is backed off 3 threads, the pipe can easily be removed from the fitting

### Complete Security

**Dynamic Sealing Method:** The mechanical advantage of the nut thread is used to push the seal into a compressed position, eliminating resistance when inserting the pipe into the fitting, so there is no risk of seal distortion or displacement.

**Visual stop:** The flange on the body of the Philmac Metric fitting provides a visual stop to indicate when the nut is fully tightened. This removes any uncertainty from the installation process.

**No Loose Components:** Although disassembly of the fitting is not required for installation, if the nut is removed there is no danger of losing components as they are all retained within the nut. Losing components in the trench becomes a thing of the past.

**Designed to minimize pipe twist:** The fitting has been designed to minimize pipe twist as the nut is tightened. Maximum pipe twist is approximately three quarters of a turn compared to one and a half turns with many other fittings. Pipe twist can impact not only on the connection you have just made but also on the connection at the other end of the line.

**Approvals:** Philmac Metric is WSAA and WaterMark approved (Australia), WRAS (UK) and ACS (France).

### High Performance Materials

**Made from advanced thermoplastic materials:** Philmac Metric is manufactured from lightweight high performance thermoplastic materials with outstanding impact, UV, chemical and corrosion resistance. The material is non-toxic and taint-free.

**Rated to 1600KPa (16 Bar):** Philmac Metric is pressure rated to 1600KPa (16 bar; PN16) to meet the needs of high pressure systems.

**50 year + design life:** Built to withstand the toughest conditions to ensure longevity and durability, Philmac Metric has a 50 year+ design life.

### Complete Coverage

**Wide range:** The Philmac Metric range is comprehensive; straight and reducing joiners, tees, elbows, threaded connectors and end caps ranging from 16 – 110mm. Philmac Metric also incorporates a range of dedicated recycled water fittings and poly to copper connections for fast and simple connection to both PE and copper pipe.



## STANDARDS

Philmac Metric is a complete range of mechanical fittings designed to make connections simple when joining metric PE pipes.

Philmac Metric's innovative and patented design comprises the following product mix;

Product Description	Size (mm)	Maximum Operating Pressure (KPa)
Compression fittings (PE x PE/FI BSP/MI BSP)	16-110	1600 (16bar)
Tapping saddles	32-110	1600 (16bar)
Accessories - Spanners - Pipe Gauge - Clips	20-110 15-34 16-110	

Philmac Metric is designed to comply with the requirements of the following standards:

### **AS/NZS4129 & 14236**

Fittings for polyethylene pressure pipe systems.

### **AS/NZS 4020 BS6920**

Products for use in contact with water intended for human consumption with regards to their effect on the quality of water.

### **AS3688**

Water supply - copper and copper alloy body compression and capillary fittings and threaded-end connectors.

### **WIS-4-32-11**

Specifications for end load resistant mechanical fittings for PE pipes of normal size less than or equal to 63mm.

### **ISO7.1 & BS21**

Pipe threads where pressure joints are made on the threads.

### **AS2129 Table E (Drill Pattern)**

Flanges for pipes, valves and fittings.

Philmac Metric is suitable for use with pipes manufactured to the dimensions specified in the following standards:

### **PE Pipes - AS/NZS4130, ISO4427, EN12201 (formally BS6572 & BS6730)**

Polyethylene pipes for pressure applications.

### **Copper Pipes - ASI432**

Copper tubes for plumbing, gas fitting and drainage applications.

Note: Philmac Metric is also suitable for use with pipes manufactured according to various overseas and international standards. Please consult Philmac Technical Services for information.



## INSTALLATION INSTRUCTIONS – METRIC



### 1. Cut Pipe Square

There is no need to prepare the pipe end. Chamfering or lubrication is not required.



### 2. Ready to use position

The fitting is pre-assembled and ready to use, however always ensure the nut is backed off with 3 threads showing to allow pipe to pass freely.



### 3. Pipe insertion

Gently insert the pipe until the first point of resistance is felt.\*



### 4. Nut tightening

The nut should be tightened by hand and then firmly with a wrench. Tighten the nut all the way to the flange on the body of the fitting.



### 5. Fully installed

The fitting is fully installed when the nut butts against the flange of the body.



### 6. Disassembly

To disassemble the fitting, simply loosen the nut using a wrench until 3 threads are showing. Pipe will be released and can be pulled out of the fitting.

\* **Slip Couplings** – To ensure adequate insertion depth, witness mark the pipes to the flange on the fitting. Then insert the pipe to the correct depth.

## INSTALLATION INSTRUCTIONS – POLY TO COPPER (ASI432)



### 1. Cut Pipe Square

Cut pipe square. Ensure the pipe is free from sharp burrs. Chamfering or lubrication is not required.



### 2. Ready to use position

The fitting is pre-assembled and ready to use.



### 3. Pipe insertion

Insert the pipe and push it past the olive.



### 4. Nut tightening

The nut should be tightened firmly with a wrench.



### 5. Fully installed

The fitting is now fully installed.

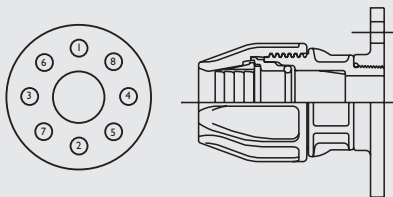


### 6. Disassembly

To disassemble the fitting, simply loosen the nut using a wrench. Pipe will be released and can be pulled out of the fitting.

\* Suitable for copper pipe ASI432

**FIGURE 1**



### Note

1. Always ensure Philmac fittings are stored away from dusty areas to avoid dust settling on the lubricated seal.
2. Philmac recommends the use of PTFE tape on BSP threads to ensure a positive seal.
3. Philmac Metric includes ergonomically designed spanners for fittings from 20 to 110mm. While fittings of sizes 20 to 32mm can be comfortably installed by hand, these spanners offer a convenient alternative.
4. When assembling a flanged adaptor, position the gasket and loosely assemble the fitting. Tighten bolts gradually in sequence shown numerically in Fig 1, to ensure even compression around the flange. Ensure washers are used under bolt heads and nuts.



## SYSTEM DESIGN CONSIDERATIONS

There are generally two types of PE pipe fittings; mechanical and thermofusion. Philmac Metric is a range of mechanical fittings that offers three distinct advantages over thermofusion fittings;

- **More economical**
- **Quick and easy installation**
- **Quick and easy revision to installation**

This section highlights engineering considerations when designing a PE pipe system with Philmac Metric.

### Projected life of Compression fittings

Whilst Philmac Metric conforms to institutionalised specifications written to have a minimum life of 50 years, its compression fittings are intentionally developed to exceed the expectations of these specifications. Projected life of Compression Fittings on page 10 depicts the projected life of the compression fittings over a range of temperatures and maximum operating pressures with a conservative safety factor.

### Head Losses

The following table offers a guide in estimating head losses in PE pipe systems based on the conveyance of water. Use the following formula to estimate this head loss;

$$L = F \times D$$

where F = fitting constant

D = pipe inner diameter (m)

L = head loss based on equivalent pipe length (m)

Fitting	Fitting Constant (F)
90° elbow	30
90° tee - straight through	12
90° tee - side branch	60

### Resistance to Impact

Philmac Metric's polypropylene body has excellent impact properties compared to other plastic materials.

### Abrasion Resistance

Philmac Metric is suitable for the transportation of abrasive slurries and will withstand normal conditions found in urban, mining, industrial, rural water and waste water systems.

### Weathering

Black polypropylene material contains pigments to provide excellent protection against degradation from ultra-violet radiation. However; long term continuous use above ground does require fittings to be protected from direct sunlight.

### Electrolytic Corrosion

The metal reinforcing rings on female threads (1¼" and above) are made from stainless steel (grade 316) and provide long term resistance to corrosion.

### Thermal Insulation

Polypropylene has natural thermal insulation of 2000 times over copper and 200 times over steel.

### Light Transmission

The all black Philmac Metric does not transmit light, thus protecting the water quality in potable water pipelines from growth of micro organisms.

### Effect on Water

Philmac Metric does not impart to the water any odour, taste, colour, or any constituents in concentrations that could be injurious to health.

### Fluids other than Water

Philmac Metric may convey a wide variety of fluids. The following table is provided as a guide only for the compatibility of various chemicals to Philmac Metric. Contact Philmac Technical Services for specific application.

## CHEMICAL RESISTANCE

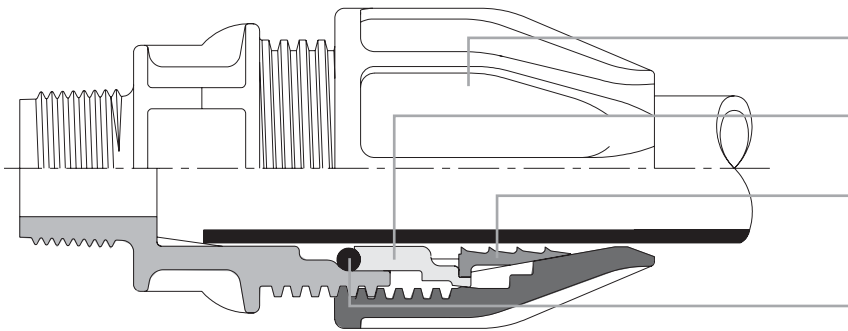
Chemical	Satisfactory	Not Satisfactory
Air	▲	
Ammonium Hydroxide	▲	
Alcohol	▲	
Acetone		▲
Auto Transmission Fluid	▲	
Antifreeze	▲	
Benzene		▲
Butane	▲	
Calcium Salts	▲	
Caustic Soda (40% aqueous)	▲	
Cresol		▲
Citric Acid (10% aqueous)	▲	
Copper Salts	▲	
Ethylene Alcohol	▲	
Ethyl Glycol	▲	
Diesel	▲	
Formic Acid		▲
Gasoline		▲
Hydrochloric Acid		▲
Kerosene		▲
Mineral Oils	▲	
Methane	▲	
Methylene Chloride		▲
Nitric Acid		▲
Petroleum Oils	▲	
Sewerage	▲	
Sodium Cyanide	▲	
Sulphuric Acid		▲
Toluene		▲
Turpentine		▲
Transformer Oil	▲	
Zinc Salt Solution	▲	

Note: Fluid Temperature = 20°C



## MATERIALS & COMPONENTS

### COMPRESSION FITTINGS



**BODY & NUT** – Polypropylene

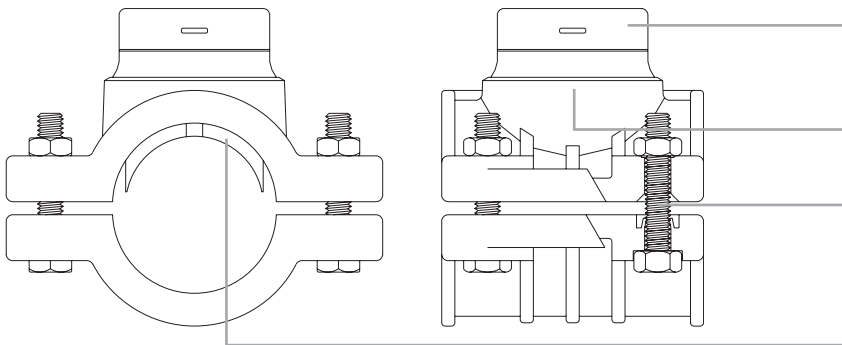
**SPACER** – Nylon

**SPLIT RING** – Acetal

**SEAL** – Nitrile Rubber

**LUBRICANT** – Silicone oil

### TAPPING SADDLES



**REINFORCING RING**

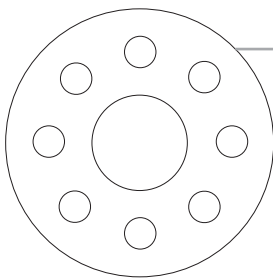
– Stainless steel

**BODY** – polypropylene

**BOLTS & NUTS** – Zinc Electroplated or Stainless steel

**SEAL** – Nitrile Rubber

### FLANGE



**FLANGE** – epoxy coated steel

### ACCESSORIES

#### Spanner

Blue powder coated, aluminium.

#### Pipe Gauge

Blue acetal (POM).

#### Clip

Black, polypropylene (PP).

## APPLICATIONS

Polyethylene Pipe (PE) is an extremely versatile material which is used for a number of applications. Accordingly, Philmac Metric provides the optimal means of connecting to PE pipes.

Philmac Metric is designed to serve a vast number of industries. The following are only some examples of its uses.

### Mining

Conveyance of water, compressed air, chemical solutions and slurries in mines and processing plants.

### Plumbing

House connections.

### Municipal Water Supply

Water treatment plants and mains-to-meter lines.

### Landfill

Conveyance of gaseous fuels

### Agriculture/Horticulture/Turf

Mains pressure irrigation systems, golf course irrigation and pump manifolds.

### Manufacturing

Conveyance of compressed air, water and chemical solutions.

## PRODUCT SPECIFICATION

## FITTINGS FOR PE TO PE PIPE CONNECTION

Guidelines for the specifications of Philmac Metric compression fittings.

### Manufacturer Accreditation

Only fittings manufactured by Manufacturers with a Quality System approved to ISO9001 or equivalent shall be accepted for use.

### Product Performance Accreditation

Fittings for Polyethylene (PE) pipes shall meet the applicable performance requirements of ISO 14236 with specific reference to:

- a) Pressure Testing (ISO 3458)
- b) External Pressure resistance testing (ISO 3459)
- c) Resistance to pull out of test assemblies at 20 degrees C (ISO 3501)
- d) Internal pressure resistance when subjected to bending stresses (ISO 3503)

Threaded ends of fittings shall be tapered and conform to ISO7.1 (specification for pipe threads for tubes and fittings where pressure tight joints are made on threads).

### Product Material Accreditation

Fittings for Polyethylene (PE) pipes shall have a body made from materials tested in accordance with ISO 9080 (Plastic piping and ducting systems – determination of the long term hydrostatic strength of thermoplastic materials in pipe form by extrapolation).

Performance verification shall be according to test parameters outlined in Clause 8.3.2.2 of ISO 14236 – Verification of long term behaviour.

Fittings shall be suitable for the conveyance of drinking water and shall conform to BS6920 (suitability of non metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of water).

### Product Configuration/ Material Overview

Fittings shall be of the compression fitting type.

Fitting bodies and nuts shall be of polypropylene material, the spacer shall be of nylon material and the split ring shall be in acetal material. Each fitting shall be supplied complete and pre assembled with captivated split ring, spacer and seal inside the nut.

Seal rings shall be made from nitrile rubber.

Fitting body colour shall be black so as to minimise potential light transmission and/or UV degradation.

### Method of Connection

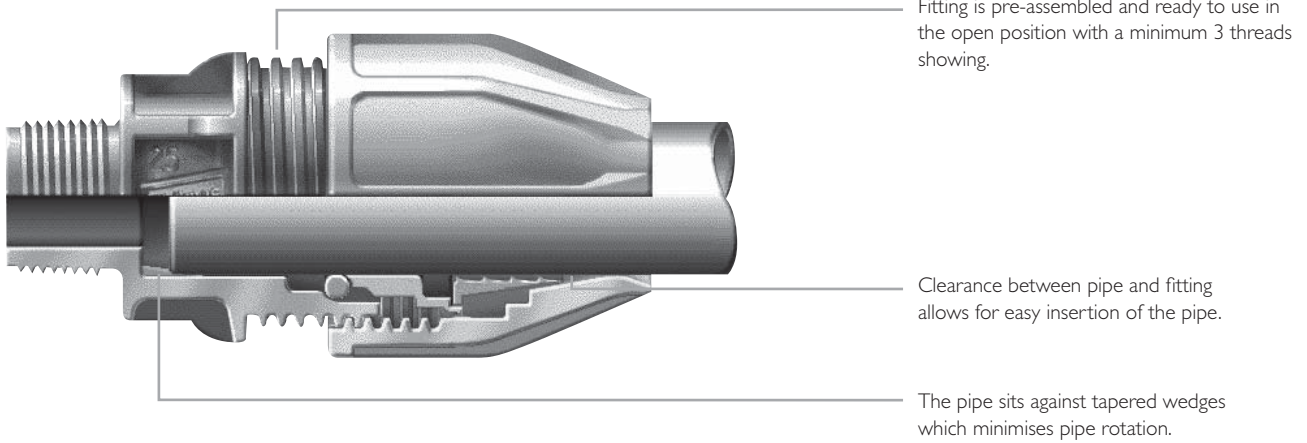
The seal of a joint will be achieved by nut tightening so as to obtain watertightness by a seal ring around the external diameter of the pipe.

Any pipe preparation will be limited to cutting and cleaning of pipe (for foreign material or burrs). Fittings shall not require the pipe to be lubricated or chamfered during installation.

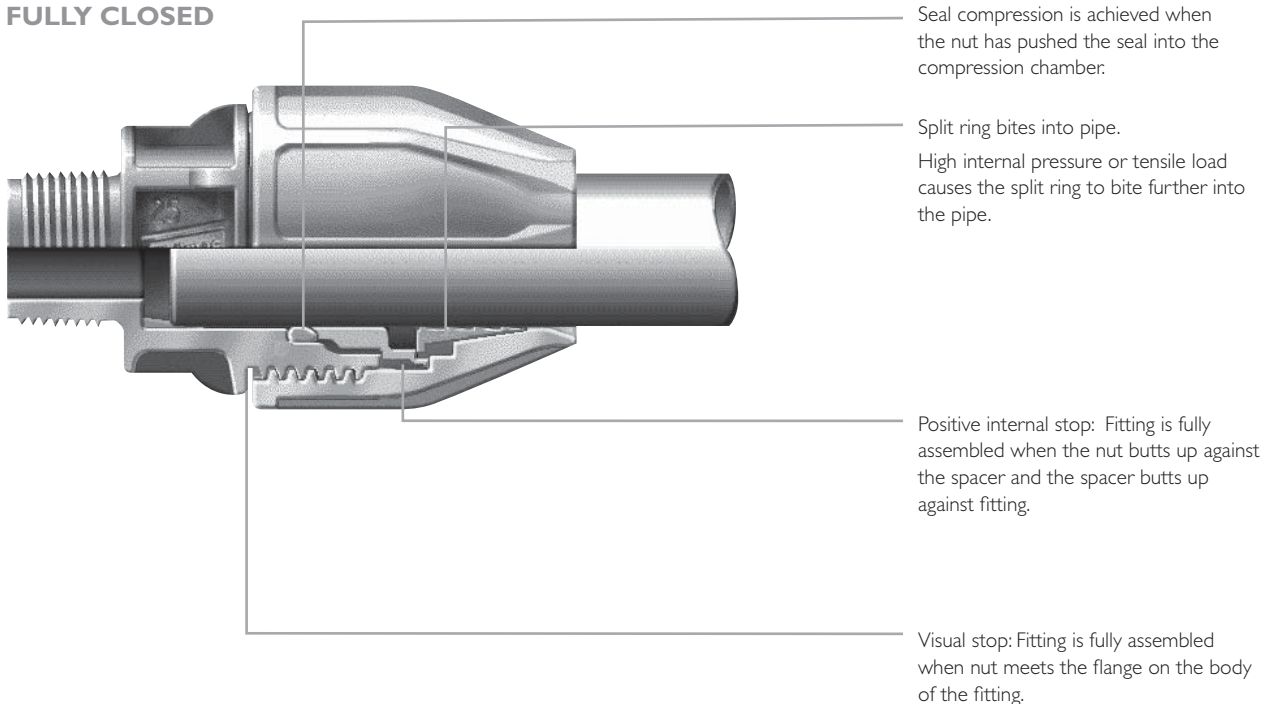
There shall be no loose components during assembly or disassembly (meaning that the fitting shall not be required to be dismantled during assembly or disassembly and if the nut is removed accidentally components will not fall out of the fitting unless removed deliberately).

## PRINCIPALS OF OPERATION – PHILMAC METRIC COMPRESSION FITTINGS

### FULLY OPEN

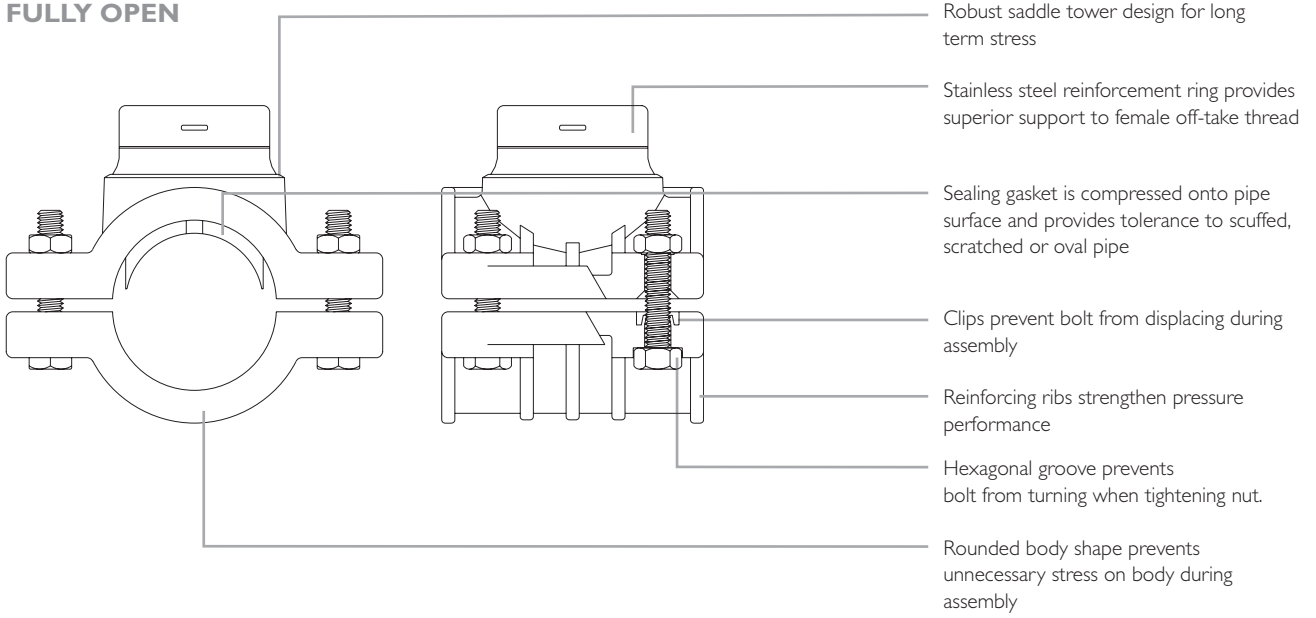


### FULLY CLOSED

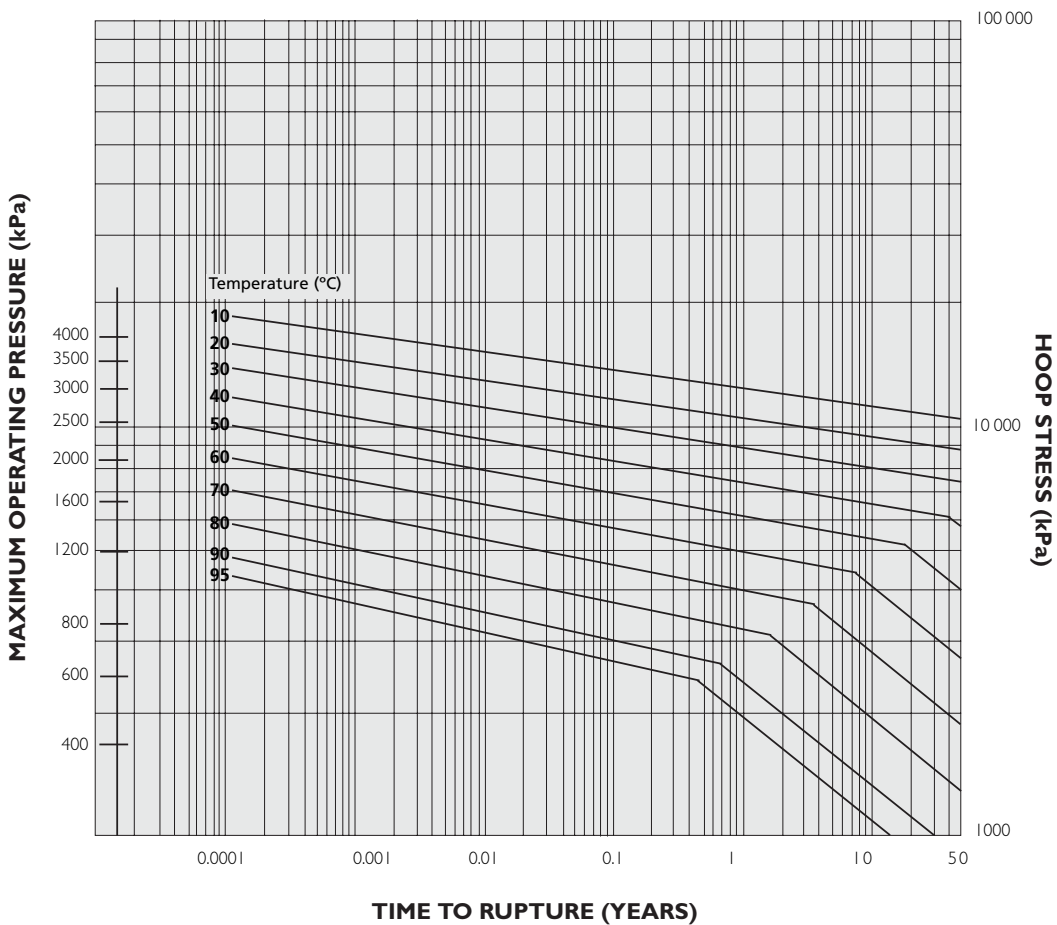


## PRINCIPALS OF OPERATION – TAPPING SADDLES

### FULLY OPEN

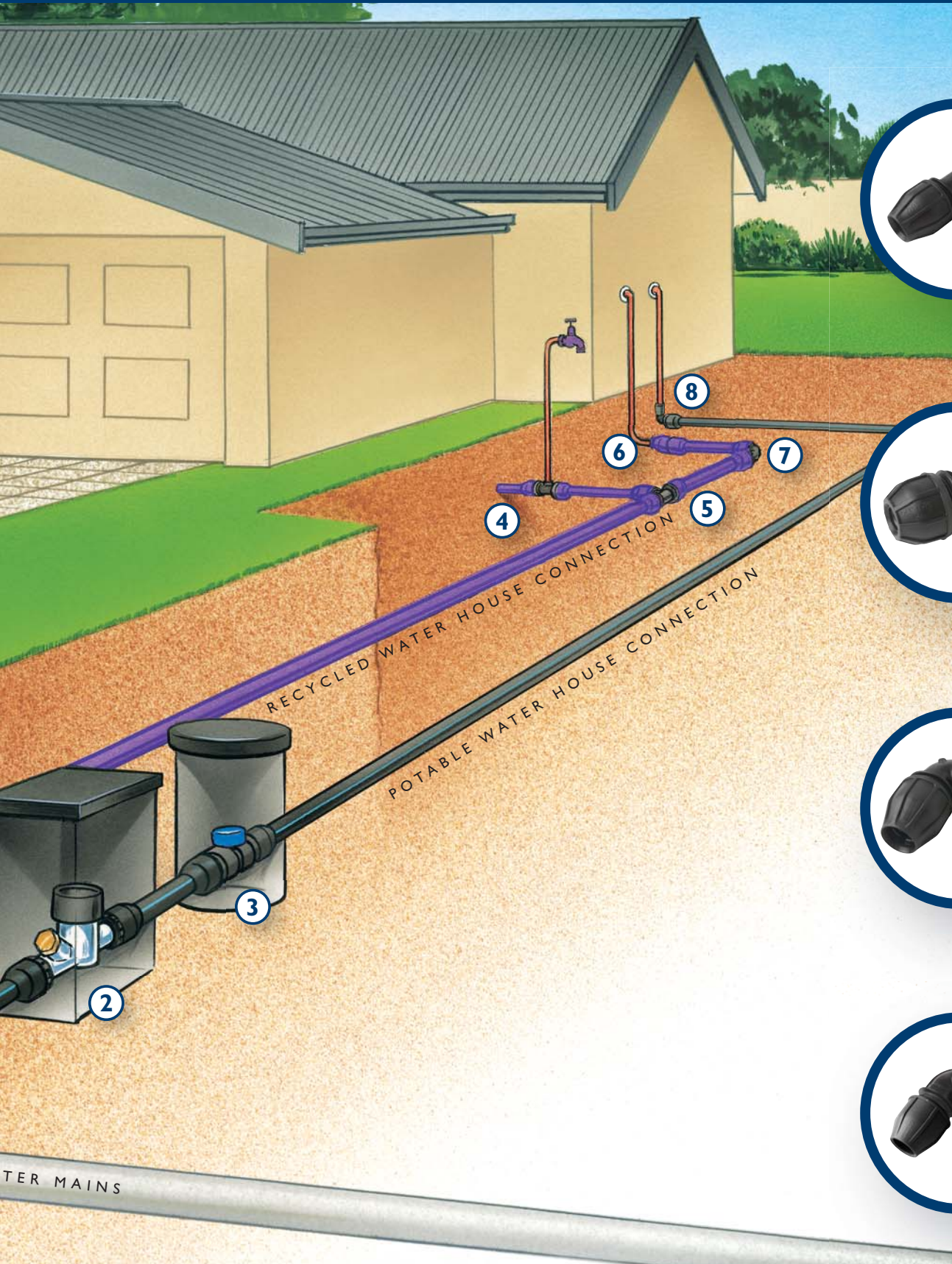


## PROJECTED LIFE OF COMPRESSION FITTINGS





# MUNICIPAL AND PLUMBING SOLUTIONS



TEE



5

UTC JOINER



6

ELBOW



7

UTC ELBOW



8

# Philmac®

The connection you can trust.



MI END CONNECTOR



TAPPING SADDLE



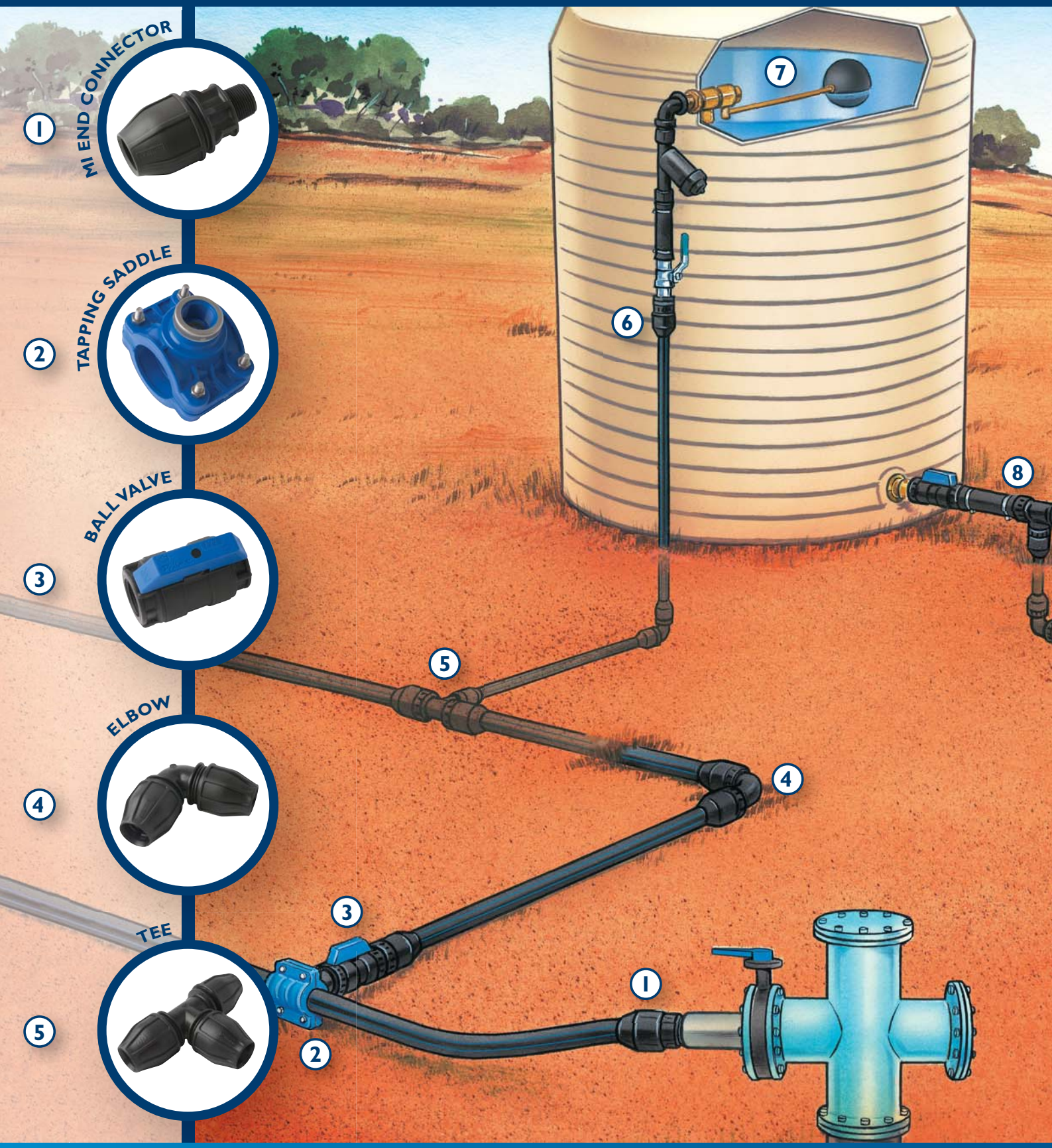
BALL VALVE



ELBOW



TEE



1

2

3

4

5

6

7

8

5

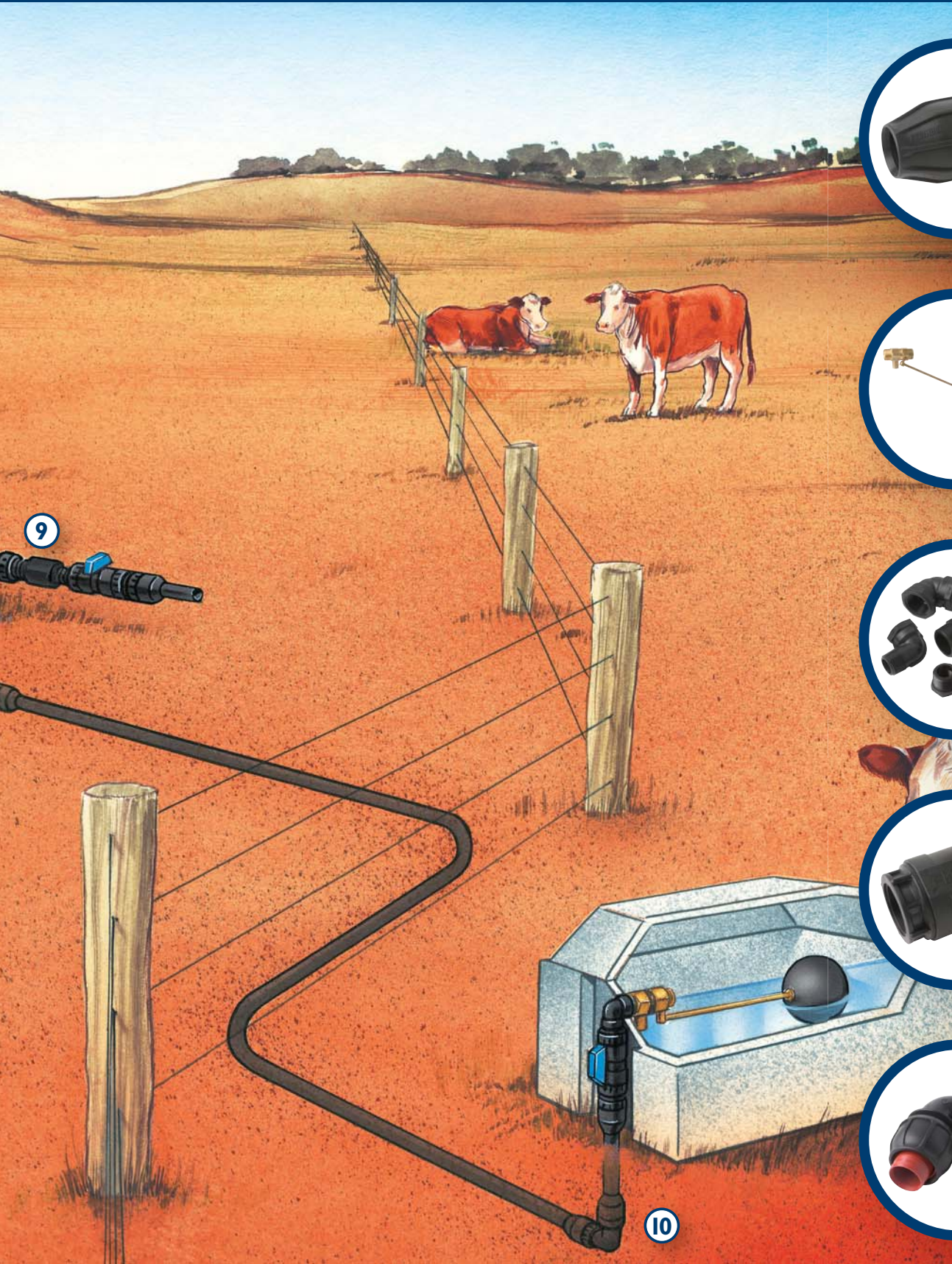
4

3

1

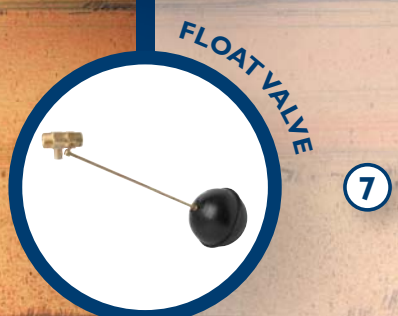
2





FI END CONNECTOR

6



FLOAT VALVE

7



THREADED FITTINGS

8



NON RETURN VALVE

9



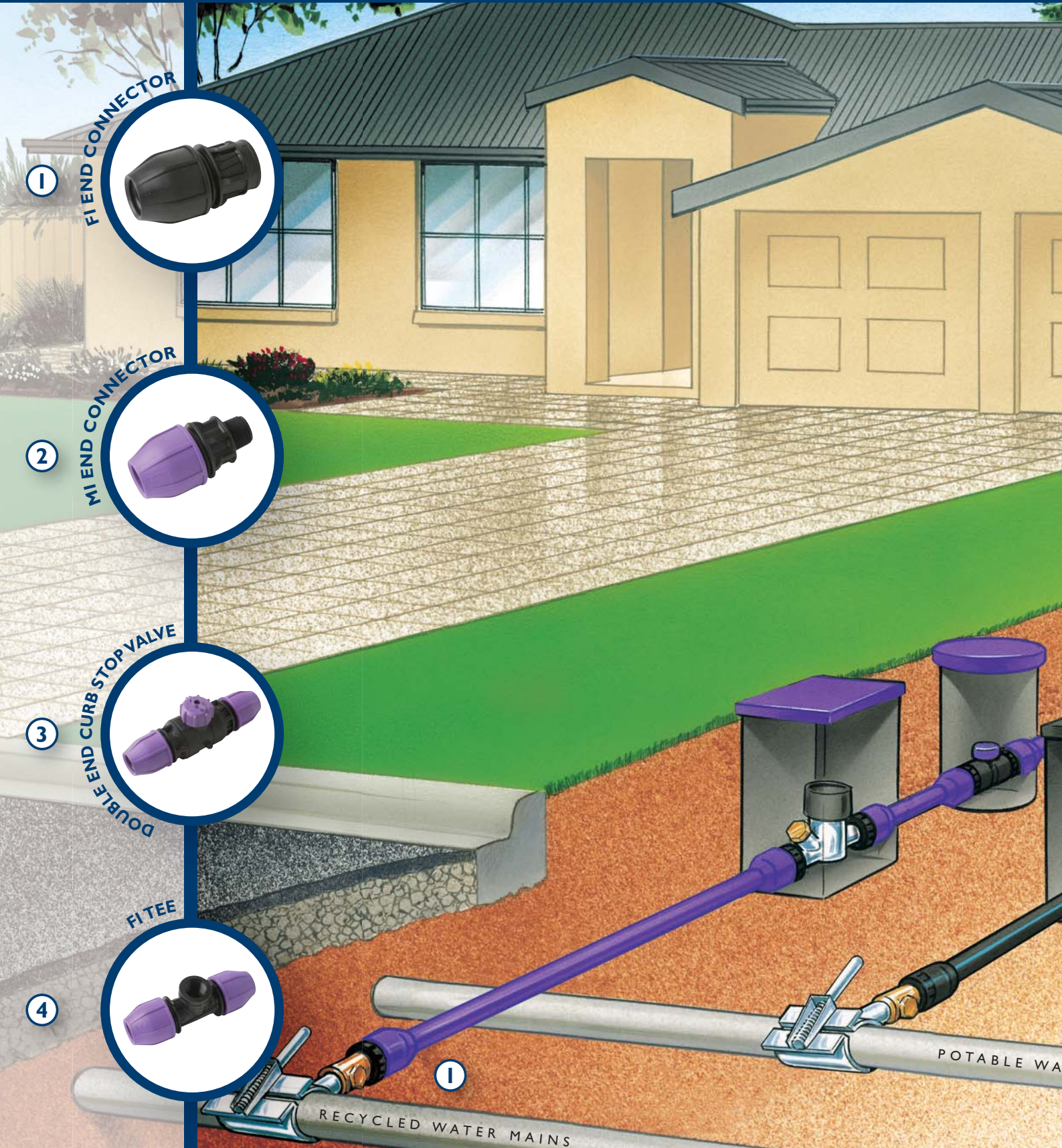
ELBOW (RURAL)

10

**Philmac**<sup>®</sup>

The connection you can trust.





1

FI END CONNECTOR



2

MI END CONNECTOR



3

DOUBLE END CURB STOP VALVE



4

FI TEE



1

RECYCLED WATER MAINS

POTABLE WA



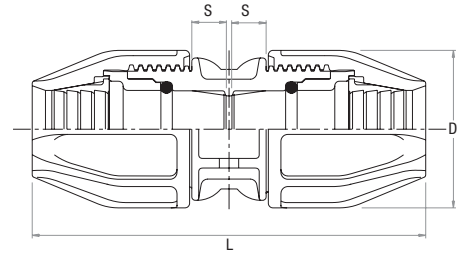
**RANGE DIMENSIONS & WEIGHTS**



## RANGE DIMENSIONS & WEIGHTS

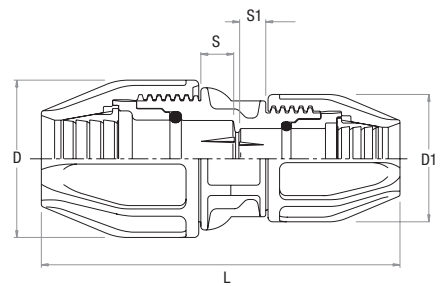
### JOINERS/COUPLING (Pol x Pol)

Size (OD)	Ref No	Dimensions mm.			kg.
		S	D	L	
16mm x 16mm	97 7111 00	9	40	108	0.06
20mm x 20mm	97 7122 00	10	47	117	0.08
25mm x 25mm	97 7133 00	11	56	140	0.13
32mm x 32mm	97 7144 00	14	69	170	0.24
40mm x 40mm	97 7155 00	18	82	205	0.41
50mm x 50mm	97 7166 00	24	96	229	0.59
63mm x 63mm	97 7177 00	29	113	251	0.89
75mm x 75mm	97 7188 00	43	134	295	1.24
90mm x 90mm	97 7199 00	50	157	350	2.06
110mm x 110mm	97 7100 00	62	190	430	3.61



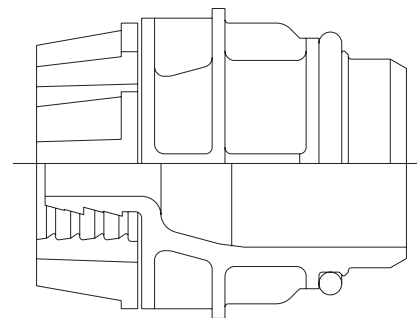
### REDUCING JOINERS/COUPLING (Pol x Pol)

Size (OD)	Ref No	Dimensions mm.					kg.
		S	S1	D	D1	L	
20mm x 16mm	97 7121 00	10	9	47	40	112	0.07
25mm x 16mm	97 7131 00	11	9	56	40	124	0.09
25mm x 20mm	97 7132 00	11	10	56	47	129	0.11
32mm x 20mm	97 7142 00	14	10	69	47	149	0.16
32mm x 25mm	97 7143 00	14	11	69	56	155	0.19
40mm x 25mm	97 7153 00	18	11	82	56	181	0.28
40mm x 32mm	97 7154 00	18	14	82	69	188	0.33
50mm x 25mm	97 7163 00	24	11	96	56	197	0.38
50mm x 32mm	97 7164 00	24	14	96	69	210	0.42
50mm x 40mm	97 7165 00	24	18	96	82	218	0.50
63mm x 32mm	97 7174 00	29	14	113	69	227	0.59
63mm x 40mm	97 7175 00	29	18	113	82	242	0.67
63mm x 50mm	97 7176 00	29	24	113	96	242	0.76
75mm x 63mm	97 7187 00	43	24	134	113	274	1.09
90mm x 75mm	97 7198 00	50	43	157	134	322	1.71
110mm x 90mm	97 7109 00	62	50	190	157	393	3.26



### REDUCING SETS (Only suitable for PE80 PN12.5 pipe)

Size (OD)	Ref No
32mm x 25mm	97 8043 00
40mm x 32mm	97 8054 00
50mm x 25mm	97 8063 00
50mm x 32mm	97 8064 00
65mm x 32mm	97 8074 00
63mm x 50mm	97 8076 00



20 – 32mm fittings are available in lilac/purple for recycled water applications  
For advice on chemical resistance properties please contact your nearest Philmac representative

## RANGE DIMENSIONS & WEIGHTS

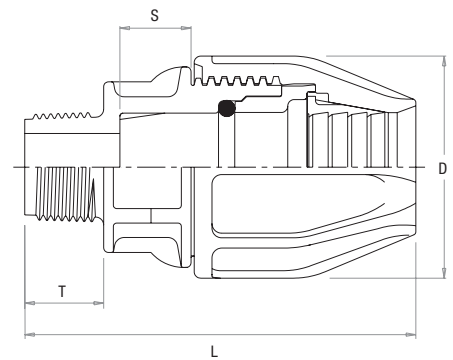
### SLIP COUPLINGS/JOINERS (Pol x Pol)

Size (OD)	Ref No
20mm x 20mm	97 1122 00
25mm x 25mm	97 1133 00
32mm x 32mm	97 1144 00
40mm x 40mm	97 1155 00
50mm x 50mm	97 1166 00
63mm x 63mm	97 1177 00

Design is the same as Joiners except that the body allows pipe insertion all the way through.

### END CONNECTORS (Pol x MI BSP)

Size (OD x BSP)	Ref No	Dimensions mm.				kg.
		S	D	L	T	Wt
16mm x ½"	97 7211 00	16	40	83	19.8	0.03
16mm x ¾"	97 7212 00	16	40	84	21.1	0.03
20mm x ½"	97 7221 00	17	47	87	19.8	0.05
20mm x ¾"	97 7222 00	17	47	88	21.1	0.05
20mm x 1"	97 7223 00	17	47	92	24.4	0.06
25mm x ½"	97 7231 00	19	56	103	19.8	0.08
25mm x ¾"	97 7232 00	19	56	104	21.1	0.08
25mm x 1"	97 7233 00	19	56	107	24.4	0.08
32mm x ¾"	97 7242 00	22	69	117	21.1	0.14
32mm x 1"	97 7243 00	22	69	120	24.4	0.14
32mm x 1¼"	97 7244 00	22	69	123	26.7	0.15
32mm x 1½"	97 7245 00	22	69	123	26.7	0.15
40mm x 1"	97 7253 00	28	82	141	24.4	0.24
40mm x 1¼"	97 7254 00	28	82	143	26.7	0.24
40mm x 1½"	97 7255 00	28	82	144	26.7	0.25
40mm x 2"	97 7256 00	28	82	148	31	0.26
50mm x 1½"	97 7265 00	30	96	152	26.7	0.34
50mm x 2"	97 7266 00	30	96	156	31	0.34
63mm x 1½"	97 7275 00	36	113	166	26.7	0.52
63mm x 2"	97 7276 00	36	113	171	31	0.53
75mm x 2"	97 7286 00	43	137	185	31	0.72
75mm x 3"	97 7288 00	43	134	190.5	36.5	0.74
90mm x 3"	97 7298 00	50	157	221	36.5	1.22
110mm x 4"	97 7209 00	62	190	269	43	2.2



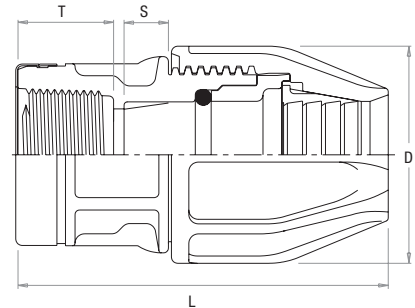
20 – 32mm fittings are available in lilac/purple for recycled water applications  
For advice on chemical resistance properties please contact your nearest Philmac representative

## RANGE DIMENSIONS & WEIGHTS

### END CONNECTORS (Pol x FI BSP)

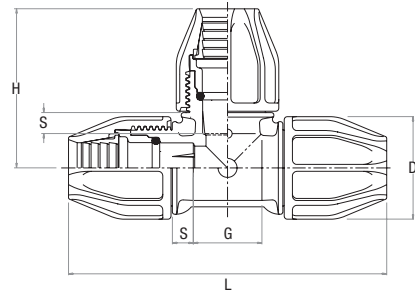
Size (OD x BSP)	Ref No	Dimensions mm.				kg.
		S	D	L	T	
16mm x 1/2"	97 7811 00	9	40	78	22.8	0.04
16mm x 3/4"	97 7812 00	9	40	79	24.1	0.05
20mm x 1/2"	97 7821 00	10	47	85	22.8	0.06
20mm x 3/4"	97 7822 00	10	47	83	24.1	0.06
20mm x 1"	97 7823 00	10	47	86	27.4	0.07
25mm x 1/2"	97 7831 00	11	56	95	22.8	0.08
25mm x 3/4"	97 7832 00	11	56	96	24.1	0.09
25mm x 1"	97 7833 00	11	56	99	27.4	0.10
32mm x 1"	97 7843 00	14	69	114	27.4	0.16
32mm x 1 1/4"	97 7844 00	14	69	116	30.2	0.16
40mm x 1 1/4"	97 7854 00	18	82	136	30.2	0.25
40mm x 1 1/2"	97 7855 00	18	82	136	30.2	0.27
50mm x 1 1/2"	97 7865 00	24	96	145	30.2	0.37
50mm x 2"	97 7866 00	24	96	149	34.5	0.39
63mm x 2"	97 7876 00	29	113	161	34.5	0.55
75mm x 2"	97 7886 00	43	134	185	34.5	0.75
90mm x 3"	97 7898 00	50	157	219	39	1.26
110mm x 4"	97 7300 00	62	190	267	46	2.20

Stainless steel reinforcing ring on 1 1/4" and above



### EQUAL TEES (Pol x Pol x Pol)

Size (OD)	Ref No	Dimensions mm.					kg.
		S	D	H	G	L	
16mm x 16mm x 16mm	97 7311 00	9	40	67	30	134	0.09
20mm X 20mm X 20mm	97 7322 00	10	47	73	31	145	0.13
25mm x 25mm x 25mm	97 7333 00	11	56	89	40	177	0.22
32mm x 32mm x 32mm	97 7344 00	14	69	106	48	211	0.39
40mm x 40mm x 40mm	97 7355 00	18	82	126	50	251	0.66
50mm x 50mm x 50mm	97 7366 00	24	96	142	60	284	0.98
63mm x 63mm x 63mm	97 7377 00	29	113	161	73	320	1.51
75mm x 75mm x 75mm	97 7388 00	43	134	188	88	375	2.20
90mm x 90mm x 90mm	97 7399 00	50	157	226	100	451	3.63
110mm x 110mm x 110mm	97 7300 00	62	190	276	120	551	6.00



### SLIP TEES - EQUAL TEES (Pol x Pol x Pol)

Size (OD)	Ref No
20mm x 20mm x 20mm	97 1322 00
25mm x 25mm x 25mm	97 1333 00
32mm x 32mm x 32mm	97 1344 00
40mm x 40mm x 40mm	9 71355 00
50mm x 50mm x 50mm	97 1366 00
63mm x 63mm x 63mm	97 1377 00

Design is the same as Equal Tees except that the body allows pipe insertion all the way through.

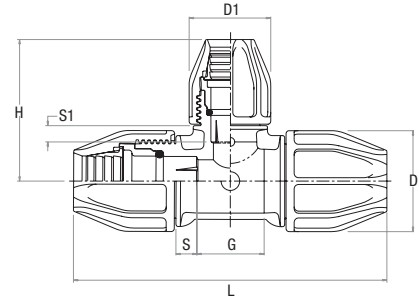
- 20 – 32mm fittings are available in lilac/purple for recycled water applications
- For advice on chemical resistance properties please contact your nearest Philmac representative
- Installation instructions for Slip Couplings can be found on page 4



## RANGE DIMENSIONS & WEIGHTS

### REDUCING TEES (Pol x Pol x Pol)

Size (OD)	Ref No	Dimensions mm.							kg.
		S	S1	D	D1	H	G	L	
25mm x 25mm x 20mm	97 7332 00	11	10	56	47	53	40	177	0.19
32mm x 32mm x 25mm	97 7343 00	14	11	69	56	88	46	211	0.34
50mm x 50mm x 40mm	97 7365 00	24	21	96	82	134	60	284	0.90
63mm x 63mm x 50mm	97 7376 00	29	24	113	96	150	73	320	1.38

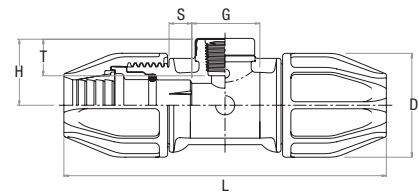


### EXPANDING TEE (Pol x Pol x Pol)

Size (OD)	Ref No	Dimensions mm.							kg.
		S	S1	D	D1	H	G	L	
25mm x 25mm x 32mm	97 7334 00	11	14	56	69	102	40	177	0.27

### TEES (Pol x FI BSP)

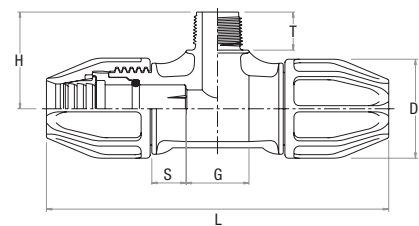
Size (OD x BSP)	Ref No	Dimensions mm.						kg.
		S	D	G	H	L	T	
16mm x 1/2"	97 7411 00	9	40	30	33	135	22.8	0.07
20mm x 1/2"	97 7421 00	10	47	31	38	145	22.8	0.10
20mm x 3/4"	97 7422 00	10	47	31	39	145	24.1	0.11
25mm x 1/2"	97 7431 00	11	56	40	40	177	22.8	0.16
25mm x 3/4"	97 7432 00	11	56	40	41	177	24.1	0.17
25mm x 1"	97 7433 00	11	56	40	44	177	27.4	0.18
32mm x 3/4"	97 7442 00	14	69	48	44	211	24.1	0.28
32mm x 1"	97 7443 00	14	69	48	44	211	27.4	0.30
32mm x 1 1/4"	97 7444 00	14	69	48	50	211	30.2	0.31
40mm x 1 1/4"	97 7454 00	18	82	50	53	251	30.2	0.49
40mm x 1 1/2"	97 7455 00	18	82	50	56	251	30.2	0.50
50mm x 1 1/2"	97 7465 00	24	96	60	67	284	30.2	0.76
50mm x 2"	97 7466 00	24	96	60	71	284	34.5	0.79
63mm x 2"	97 7476 00	29	113	73	77	320	34.5	1.16
75mm x 2"	97 7486 00	43	134	88	109	375	34.5	2.24
90mm x 3"	97 7498 00	50	154	100	123	451	39	3.63
110mm x 4"	97 7409 00	62	190	120	150	551	46	6.07



Stainless steel reinforcing ring on 1 1/4" and above

### TEES (Pol x MI BSP)

Size (OD x BSP)	Ref No	Dimensions mm.						kg.
		S	D	G	H	L	T	
25mm x 1/2"	97 7931 00	11	56	35	53	188	19.8	0.17
25mm x 3/4"	97 7932 00	11	56	35	54	188	21.1	0.17

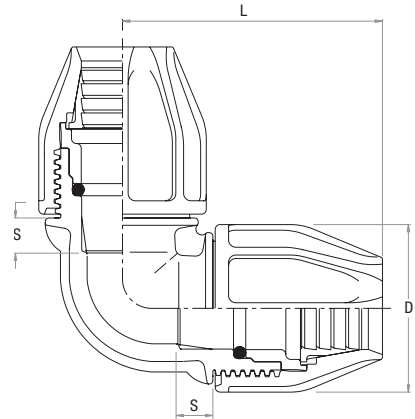


20 – 32mm fittings are available in lilac/purple for recycled water applications  
For advice on chemical resistance properties please contact your nearest Philmac representative

## RANGE DIMENSIONS & WEIGHTS

### ELBOWS (Pol x Pol 90°)

Size (OD)	Ref No	Dimensions mm.			kg.
		S	D	L	Wt
16mm x 16mm	97 7511 00	9	40	67	0.06
20mm x 20mm	97 7522 00	10	47	73	0.09
25mm x 25mm	97 7533 00	11	56	89	0.15
32mm x 32mm	97 7544 00	14	69	107	0.26
40mm x 40mm	97 7555 00	18	82	124	0.45
50mm x 50mm	97 7566 00	24	96	142	0.67
63mm x 63mm	97 7577 00	29	113	161	1.04
75mm x 75mm	97 7588 00	43	134	192	1.47
90mm x 90mm	97 7599 00	50	157	233	2.44
110mm x 110mm	97 7500 00	62	190	275	4.29

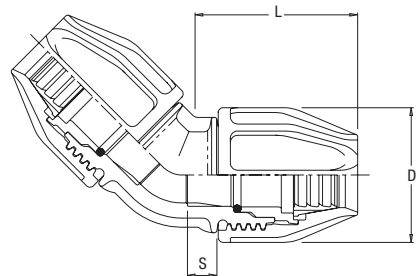


### REDUCING ELBOW (Pol x Pol 90°)

Size (OD)	Ref No	Dimensions mm.			kg.
		S	D	L	Wt
25mm x 20mm	97 7523 00	11	-	81	0.13

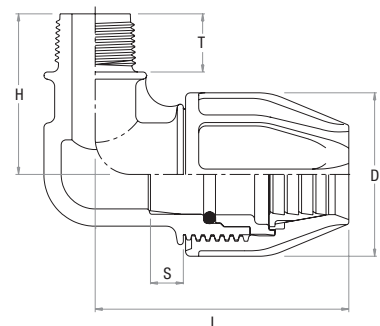
### ELBOWS (Pol x Pol 45°)

Size (OD)	Ref No	Dimensions mm.			kg.
		S	D	L	Wt
20mm x 20mm	97 7028 00	10	47	63	0.09
25mm x 25mm	97 7038 00	11	56	71	0.15
32mm x 32mm	97 7048 00	14	69	85	0.26



### ELBOWS (Pol x MI BSP)

Size (OD x BSP)	Ref No	Dimensions mm.					kg.
		S	D	H	L	T	Wt
25mm x 3/4"	97 7732 00	13	56	49	104	21.1	0.09
32mm x 1"	97 7743 00	14	69	68	127	24.4	0.17

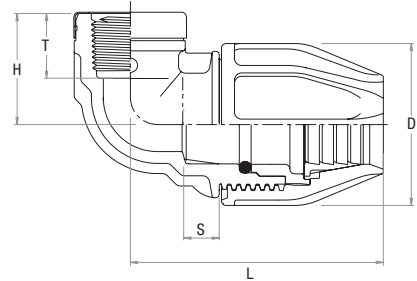


20 – 32mm fittings are available in lilac/purple for recycled water applications  
For advice on chemical resistance properties please contact your nearest Philmac representative

## RANGE DIMENSIONS & WEIGHTS

### ELBOWS (Pol x FI BSP)

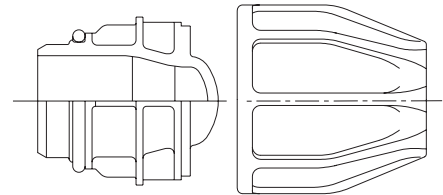
Size (OD x BSP)	Ref No	Dimensions mm.					kg.
		S	D	H	L	T	
16mm x 1/2"	97 7611 00	9	40	33	67	22.8	0.04
20mm x 1/2"	97 7621 00	10	47	38	73	22.8	0.05
20mm x 3/4"	97 7622 00	10	47	39	73	24.1	0.07
25mm x 1/2"	97 7631 00	11	56	40	88	22.8	0.08
25mm x 3/4"	97 7632 00	11	56	41	88	24.1	0.10
25mm x 1"	97 7633 00	11	56	44	88	27.4	0.11
32mm x 1"	97 7643 00	14	69	48	105	27.4	0.17
32mm x 1 1/4"	97 7644 00	14	69	50	105	30.2	0.18
40mm x 1 1/4"	97 7654 00	18	82	53	126	30.2	0.28
40mm x 1 1/2"	97 7655 00	18	82	56	126	30.2	0.30
50mm x 1 1/2"	97 7665 00	24	96	71	142	30.2	0.43
50mm x 2"	97 7666 00	24	96	77	142	34.5	0.46
63mm x 2"	97 7676 00	29	113	77	160	34.5	0.68
75mm x 2"	97 7686 00	43	134	109	189	34.5	1.47
90mm x 3"	97 7698 00	50	157	122	223	39	2.44
110mm x 4"	97 7609 00	62	190	145	273	46	4.29



Stainless steel reinforcing ring on 1 1/4" and above

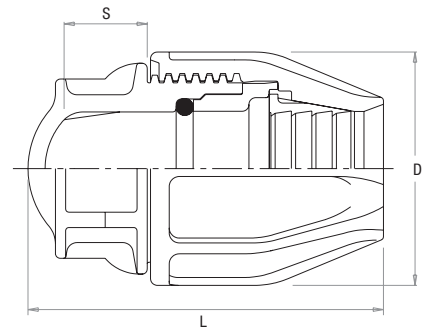
### BLANKING SETS (Pol)

Size (OD)	Ref No
20mm	97 7022 00
25mm	97 7033 00
32mm	97 7044 00
40mm	97 7055 00
50mm	97 7066 00
63mm	97 7077 00



### END CAPS (Pol)

Size (OD)	Ref No	Dimensions mm.			kg.
		S	D	L	
16mm	97 7019 00	18	40	67	0.03
20mm	97 7029 00	19	47	74	0.05
25mm	97 7039 00	23	56	90	0.08
32mm	97 7049 00	24	69	104	0.13
40mm	97 7059 00	31	82	127	0.23
50mm	97 7069 00	33	96	139	0.33
63mm	97 7079 00	41	113	159	0.51
75mm	97 7089 00	48	134	170	0.71
90mm	97 7099 00	55	157	220	1.14
110mm	97 7009 00	67	190	250	1.81

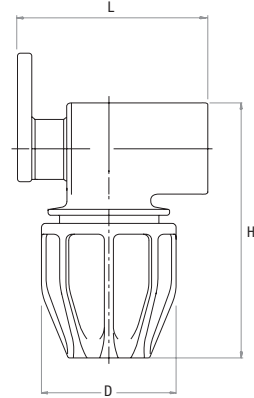


20 – 32mm fittings are available in lilac/purple for recycled water applications  
For advice on chemical resistance properties please contact your nearest Philmac representative

## RANGE DIMENSIONS & WEIGHTS

### BRASS WALL PLATE ELBOW (Pol x FI BSP)

Size (ODxBSP)	Ref No	Dimensions mm.			kg.
		D	L	H	Wt
25mm x 3/4"	97 7239 00	55	65	88	0.47

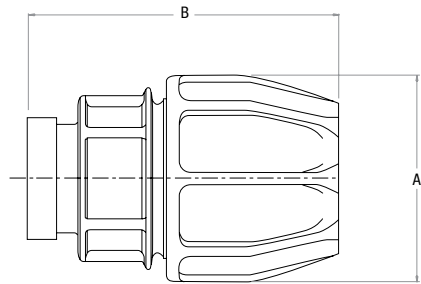


### PLASTIC WALL PLATE ELBOW (Pol x FI BSP)

Size (ODxBSP)	Ref No	Dimensions mm.			kg.
		D	L	H	Wt
20mm x 1/2"	97 7022 11	47	56	76	0.06
25mm x 3/4"	97 7032 11	55	65	88	0.08

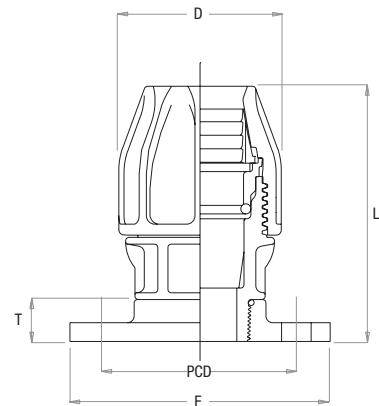
### SHOULDERED ADAPTOR

Size (OD)	Ref No	Dimensions mm.			kg.
		A	B	Wt	
50mm x 2"	97 716620	96	165	0.34	
63mm x 2"	97 717620	113	178	0.52	
90mm x 4"	97 719910	157	235	1.34	
110mm x 4"	97 710910	190	282	2.15	



### FLANGED ADAPTORS (Pol x Flange Table E)

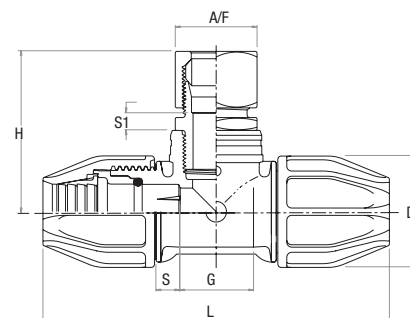
Size (OD)	Ref No	Dimensions mm.						kg.
		PCD	No. of bolt holes	D	L	T	F	Wt
50 x 2"	97 7766 00	114	4	96	156	32	150	2.40
63 x 2"	97 7776 00	114	4	113	166	32	150	2.60
75 x 3"	97 7788 00	146	4	134	190.5	37.5	185	2.92
90 x 3"	97 7798 00	146	4	157	221	37.5	185	3.40
110 x 4"	97 7709 00	178	8	190	269	44	215	5.10



Diameter of bolt holes is 18mm.  
Maximum operating pressure is 1600kPa.

### TRANSITION FITTINGS (TEES)\* (PE Metric x Copper – ASI432)

Size (OD x BSP)	Ref No	Dimensions mm.							kg.
		S	S1	D	H	G	A/F	L	Wt
20mm x 20mm x 1/2"	99 6921 00	11	6	56	62	40	25.4	145	0.2
25mm x 25mm x 1/2"	99 6931 00	11	6	56	66	40	25.4	177	0.26
25mm x 25mm x 3/4"	99 6932 00	11	6	56	67	40	31.8	177	0.31



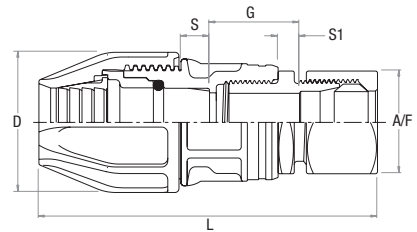
\*Supplied with Nut (DR Brass) and Olive.

20 – 32mm fittings are available in lilac/purple for recycled water applications  
For advice on chemical resistance properties please contact your nearest Philmac representative

## RANGE DIMENSIONS & WEIGHTS

### TRANSITION FITTINGS (JOINERS/COUPLING)\* (PE Metric x Copper – ASI432)

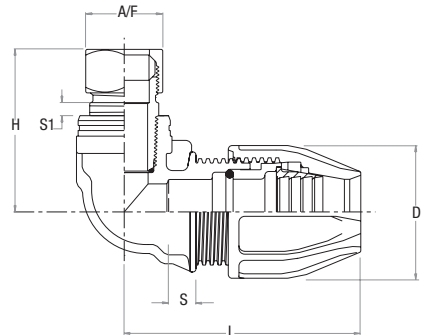
Size (OD x BSP)	Ref No	Dimensions mm.						kg.
		S	S1	D	G	A/F	L	
16mm x ½"	99 6211 00	9	6	40	32	25.4	93	0.13
20mm x ½"	99 6221 00	10	6	47	33	25.4	108	0.14
20mm x ¾"	99 6222 00	10	6	47	33	31.8	108	0.19
25mm x ½"	99 6231 00	11	6	56	33	25.4	120	0.18
25mm x ¾"	99 6232 00	11	6	56	33	31.8	123	0.22
32mm x ¾"	99 6242 00	14	6	69	33	31.8	140	0.30



\*Supplied with Nut (DR Brass) and Olive.

### TRANSITION FITTINGS (ELBOWS)\* (PE x Copper – ASI432)

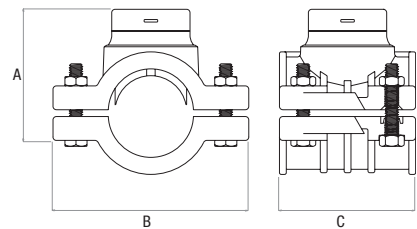
Size (OD)	Ref No	Dimensions mm.						kg.
		S	S1	D	H	A/F	L	
20mm x ½"	99 6721 00	10	6	47	62	25.4	73	0.16
25mm x ½"	99 6731 00	11	6	56	66	25.4	88	0.19
25mm x ¾"	99 6732 00	11	6	56	67	31.8	88	0.23



\*Supplied with Nut (DR Brass) and Olive.

### TAPPING SADDLES Pol/PP/ABS (Metric size) x FI BSP

Size (OD x BSP)	Ref No Zinc Plated Nuts and Bolts	Ref No Stainless Steel Nuts and Bolts	No. of bolt holes	Bolt Size	A	B	C
25 x ¾"	97703200	97753200	2	M8 x 45	-	-	-
32 x ¾"	97704200	97754200	2	M8 x 45	67	92	66
32 x 1"	97704300	97754300	2	M8 x 45	67	92	66
40 x ¾"	97705200	97755200	4	M8 x 45	81	96	67
40 x 1"	97705300	97755300	4	M8 x 45	81	96	67
50 x ¾"	97706200	97756200	4	M8 x 45	95	115	80
50 x 1"	97706300	97756300	4	M8 x 45	95	115	80
63 x ¾"	97707200	97757200	4	M8 x 55	110	126	89
63 x 1"	97707300	97757300	4	M8 x 55	110	126	89
63 x 1½"	97707500	97757500	4	M8 x 55	110	126	89
75 x ¾"	97708200	97758200	4	M10 x 65	127	141	99
75 x 1"	97708300	97758300	4	M10 x 65	127	141	99
75 x 1½"	97708500	97758500	4	M10 x 65	127	141	99
75 x 2"	97708600	97758600	4	M10 x 65	127	141	99
90 x 1"	97709300	97759300	4	M10 x 65	141	160	104
90 x 1½"	97709500	97759500	4	M10 x 65	141	160	104
90 x 2"	97709600	97759600	4	M10 x 65	141	160	104
110 x 1"	97700300	97750300	4	M10 x 65	161	181	108
110 x 1½"	97700500	97750500	4	M10 x 65	161	181	108
110 x 2"	97700600	97750600	4	M10 x 65	161	181	108



Stainless steel reinforcing rings on all sizes

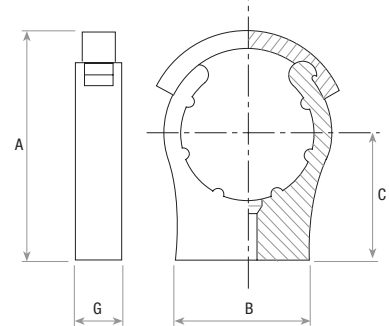
20 – 32mm fittings are available in lilac/purple for recycled water applications  
For advice on chemical resistance properties please contact your nearest Philmac representative



## RANGE DIMENSIONS & WEIGHTS

### PIPE CLIPS (Bolts/Screws not included)

Size (OD)	Ref No	Bolt size	Dimensions mm.				kg.
			A	B	C	G	Wt
16mm	13 4343 05	M4	-	35	25	16	.007
20mm	13 4343 06	M5	-	35	30	16	.008
25mm	13 4343 07	M5	-	35	35	17	.011
32mm	13 4343 08	M5	-	40	40	17	.014
40mm	13 4343 09	M5	-	45	45	20	.021
50mm	13 4343 10	M6	85	50	50	21	.030
63mm	13 4343 11	M6	102	60	60	21	.042
75mm	13 4343 12	M8	122	70	70	31	.094
90mm	13 4343 13	M8	148	80	90	31	.121
110mm	13 4343 14	M8	171	90	96	35	.085



### METRIC CHEMICAL RESISTANT KITS Viton A O-Ring with Polypropylene Spacer Kit

Size (OD)	Ref No
20mm	90 7022 10
25mm	90 7033 10
32mm	90 7044 10
40mm	90 7055 10
50mm	90 7066 10
63mm	90 7077 10
75mm	90 7088 10
90mm	90 7099 10
110mm	90 7000 10

### EPDM O-RING with Polypropylene Spacer Kit

Size (OD)	Ref No
20mm	90 7122 24
25mm	90 7133 24
32mm	90 7144 24
40mm	90 7155 24
50mm	90 7166 24
63mm	90 7177 24
70mm	90 7188 24
90mm	90 7199 24
110mm	90 7100 24

### METRIC CHEMICAL RESISTANT KIT -2 (For submerged applications)

with EPDM O-Ring, Polypropylene Spacer and Polysulfone Split Ring

Size (OD)	Ref No
20mm	90 7122 10
25mm	90 7133 10
32mm	90 7144 10
40mm	90 7155 10
50mm	90 7166 10
63mm	90 7177 10
75mm	90 7188 10
90mm	90 7199 10

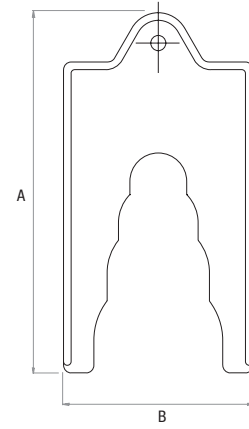
Chemical resistance for submerged application.

20 – 32mm fittings are available in lilac/purple for recycled water applications  
For advice on chemical resistance properties please contact your nearest Philmac representative

## RANGE DIMENSIONS & WEIGHTS

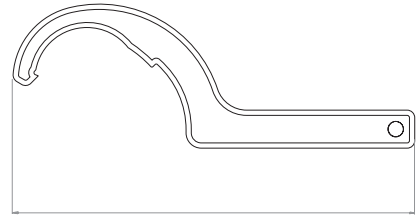
### PIPE MEASURING GAUGE (15mm - 34mm)

Size (OD)	Ref No	Dimensions mm.		kg.
		<b>A</b>	<b>B</b>	<b>Wt</b>
15 - 34mm	97 1135 00	95	50	0.016



### SPANNERS

Size (OD)	Ref No	Dimensions mm.		kg.
		<b>L</b>	<b>Wt</b>	
20 - 32mm	90 7024 00	170	0.03	
32 - 63mm	90 7047 00	265	0.10	
50 - 110mm	90 7050 00	460	0.35	



20 – 32mm fittings are available in lilac/purple for recycled water applications  
For advice on chemical resistance properties please contact your nearest Philmac representative

**Philmac Pty Ltd**

47-59 Deeds Road  
North Plympton  
South Australia  
AUSTRALIA 5037

**AUSTRALIA SALES**

Ph: 1800 755 899  
Fax: 1800 244 688

**INTERNATIONAL SALES**

Telephone +61 8 8300 9217  
Facsimile +61 8 8300 9390