INTRODUCTION

Philmac, the global leader in the design and manufacture of plastic compression fittings, has developed a unique range of mechanical compression fittings that provide the ultimate in pipe connection flexibility.

Without modification the same fitting connects to a variety of materials including PVC, copper, galvanized iron, ABS, lead, stainless steel, steel, polyethylene and PEX.

Each size fitting covers a range of pipe diameters providing a 'Universal' solution. Providing a seal on out-of-round and pitted pipes is another aspect of the 'Universal' solution.

Since winning an Australian Design Award in 1999 for innovation in product development, the UTC® has been embraced by water utilities right around the world, including the UK, Europe, Middle East, North America and Australia.

BENEFITS

Universal Design: Through its wide tolerance, the Philmac UTC® is designed to accommodate a range of different diameters on most pipe material (including PVC, copper, galvanized iron, ABS, lead, stainless steel, steel, polyethylene and PEX).

Large Seal: The large seal in Philmac UTC® is particularly suited to Out-of-Round and Pitted pipes

Slide & Tighten™ technology: The Philmac UTC® incorporates all the benefits of Philmac's Slide & Tighten™ technology.

Simply witness mark the pipe against the flange on the fitting, and then insert the pipe to the correct depth. The nut can then be tightened using a wrench. The UTC® is fully installed when the nut can no longer be tightened with reasonable force.

No special tools are required and the Philmac UTC® is supplied ready to use.

Easy Disassembly: The design of the UTC® means that once the nut is backed off, the pipe can easily be removed from the fitting

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

** Pipes at the top end of the fitting tolerance may incur minimum resistance.*

No Loose Components: The Philmac UTC® is fully integrated with no loose components. There is no need for individual assembly of a split ring, sealing ring or nut. All that is required is the insertion of the pipe and tightening of the nut.

Approvals: The Philmac UTC® holds a number of potable water approvals – WRAS (UK) for above and below ground use; WSAA and WaterMark (Australia); ACS (France); DTC (Denmark), CSA (Canada) and NSF (USA). The fittings are also manufactured to the highest standards in accordance with the company's ISO 9001:2000 Quality Endorsed status.

Dielectric (insulating) fitting

UTC® fittings are insulating and are a "Dielectric" fitting for use between dis-similar metals.

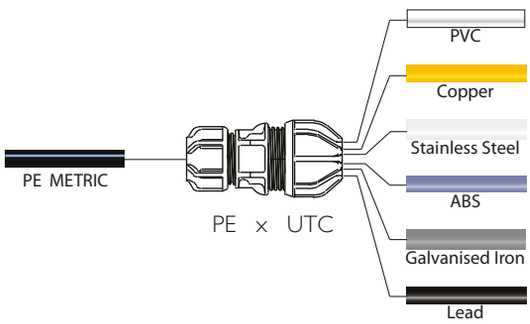
Made from advanced thermoplastic materials: The Philmac UTC® is manufactured from lightweight high performance thermoplastic materials with outstanding impact, UV, chemical and corrosion resistance. The UTC® end contains hard stainless steel grippers which provide superior end load resistance.

Rated to 12.5 Bar (180psi): The Philmac UTC® is pressure rated to 12.5 bar (180psi) at 23 °C (73 °F) to meet the needs of high pressure systems.

50 year + design life: Built to withstand the toughest conditions to ensure longevity and durability, Philmac UTC® has a 50 year+ design life at 23 °C (73 °F).

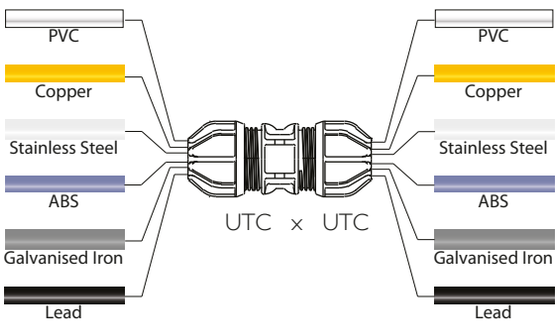
The Philmac UTC® range is comprehensive: Straight and reducing joiners, elbows, tees and male adaptors, in both transition (PE to UTC®) and double ended versions (UTC® to UTC®) ranging from 15mm to 61mm

FAMILY OF FITTINGS - A COMPREHENSIVE RANGE



Connects PE to a wide variety of pipes

PVC, copper, galvanised iron, ABS, lead, stainless steel, steel, polyethylene and PEX



Connects a wide variety of pipes

PVC, copper, galvanised iron, ABS, lead, stainless steel, steel, polyethylene and PEX

APPLICATIONS

Repair work

UTC® is used extensively by water companies, plumbers and civil contractors for repair work. The UTC® x UTC® fitting was originally developed as a copper to copper repair joint at the request of a global water company.

New installations

Connecting polyethylene pipe to water meter risers and polyethylene pipe to copper.

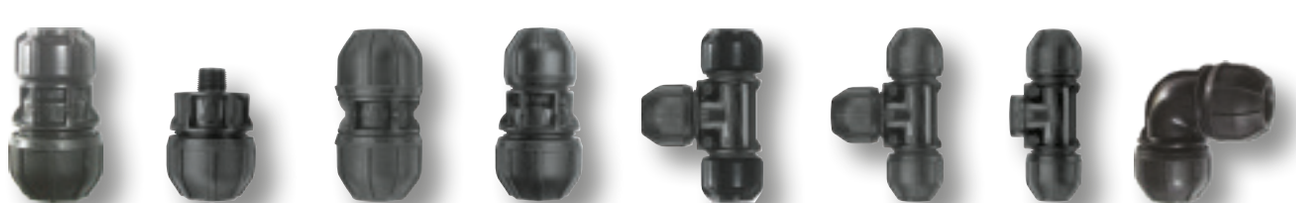
UTC® fittings are used by water companies as a connection between polyethylene pipe and metal pipes.

Upgrades

UTC® is particularly useful in service line upgrades. A small number of PE x UTC® fitting provide a complete solution and will connect to whatever pipe the installer finds at the property boundary.

A UTC® x Threaded Tee provides a solution when tieing an irrigation system into an existing water service line.

COMPLETE RANGE



Coupler 3G Metric PE x UTC

Male Adaptor x UTC

Coupler UTC x UTC

Reducing Coupler UTC x UTC

Tee 3G Metric PE x UTC

Tee UTC

Fl Tee UTC

Elbow UTC

STANDARDS

Philmac UTC® range of compression fittings hold certificates for the following standards:

AS/NZS 4020 Products for use in contact with water intended for human consumption with regards to their effect on the quality of water.

Watermark (Australia)

BS6920 Fitting materials approved for use in potable water applications.

ASC (France) Fitting materials approved for use in potable water applications.

DVGW (Germany)

WRAS (United Kingdom)

SVGW (Switzerland)

KIWA (Netherland)

Threads

ISO 7.1 Pipe threads where pressure joints are made on the threads. Part 1 Dimensions, tolerances and designations.

ATS 5200.458 Australian Technical Specification for Plumbing and Drainage Products, Part 458, Universal Transition Fitting.

AS/NZS 4129 Fittings for use with polypropylene (PE) pipes for pressure applications. (UTCxPoly only)

UTC fittings exceed the requirements of the following international standards:

ISO 14236:2000 Plastic pipes and fittings -- Mechanical - joint compression fittings for use with polyethelene (PE) pressure pipes in water supply systems.

ISO 3458:1976 Assembled joints between fittings and polyethelene (PE) pressure pipes -- Test of leak-proofness under internal pressure.

ISO 3459:1976 Polyethelene (PE) pressure pipes -- Joints assembled with mechanical fittings -- Internal under-pressure test method and requirements.

ISO 3501:1976 Assembled joints between fittings and polyethelene (PE) pressure pipes -- Test of resistance to pull out.

ISO 3503:1976 Assembled joints between fittings and polyethelene (PE) pressure pipes -- Test of leak-proofness under internal pressure when subjected to bending.

SYSTEM DESIGN CONSIDERATIONS

Philmac UTC® is a range of mechanical fittings that offers three distinct advantages over thermofusion fittings;

- **The ability to transition from PE to any recommended pipe material**
- **The ability to connect multiple types of pipes together**
- **Quick and easy installation and disassembly**

This section highlights engineering considerations when designing a pipe system with Philmac UTC®.

Projected life of Compression Fittings

Whilst the Philmac UTC® conforms to institutionalized specifications written to have a minimum life of 50 years, its compression fittings are intentionally developed to exceed the expectations of these specifications.

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 x 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

Abrasion Resistance

Philmac UTC® 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

The materials used contain 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 plastic body provides an effective means of isolation against electrolytic action when connecting two metal pipes. The stainless steel (grade 304) gripper teeth 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 UTC® does not transmit light, thus protecting the water quality in potable water pipelines from growth of micro organisms.

Effect on Water.

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

Fluids other than Water

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

CHEMICAL RESISTANCE

Chemical	Satisfactory	Not Satisfactory
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		

PRINCIPALS OF OPERATION – COMPRESSION FITTINGS

FULLY OPEN – 3G™ PE END

Fitting is pre-assembled ready to use in the open position with 2 threads showing.

Clearance between the pipe and fitting allows for easy insertion of the pipe.

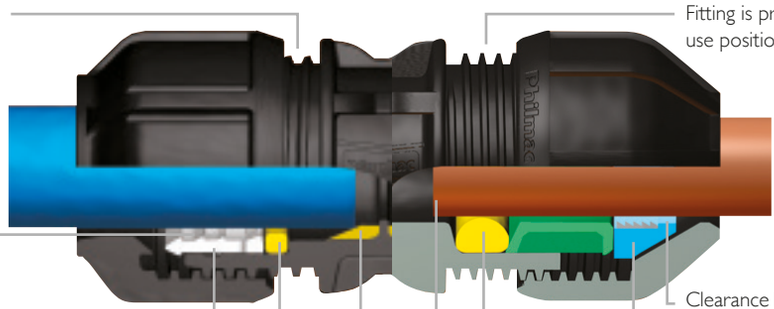
Split collet, which is in relaxed position.

Seal, which is in relaxed position.

The pipe sits against the tapered wedges which minimises pipe rotation.

FULLY OPEN – UTC® END

Fitting is pre-assembled in the ready to use position with 3 threads showing



Clearance between the pipe and fitting allows for easy insertion of the pipe

Split ring – is in a relaxed position

Seal – is in a relaxed position

Pipe is inserted up to the flange on the fitting

FULLY CLOSED – 3G™ PE END

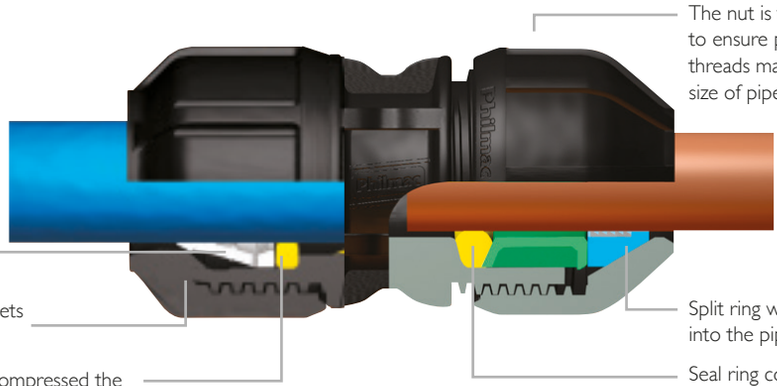
Split collet bites into the pipe providing end load resistance.

Positive internal stop when nut meets flange of the body.

Nut and then split collet has fully compressed the seal. Seal ring compression is achieved by exploiting the mechanical advantage of the nut thread.

FULLY CLOSED – UTC® END

The nut is tightened with a wrench firmly to ensure proper installation. Some threads may be exposed, depending on the size of pipe inserted into the fitting.



Split ring with the stainless grippers bites into the pipe providing end load resistance

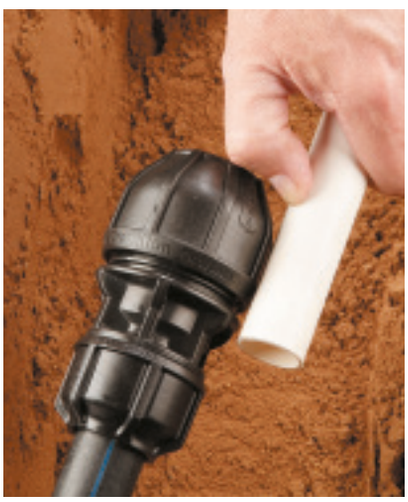
Seal ring compression is achieved by exploiting the mechanical advantage of the thread.

INSTALLATION INSTRUCTIONS – UTC®

(Joins PE, copper, stainless steel, ABS, galvanized iron, lead, steel or PVC pipes)

1. Cut pipe to length

Cut pipe square and to length using the flange on the central body as a guide. Ensure end of connecting pipe is undamaged and clean.



2. Ready to use position.

The fitting is pre-assembled and ready to use, however always ensure the nut is backed off and 3 threads are showing. Pipes at the top end of the fitting tolerance may require 5 threads showing.

3. Pipe insertion

To ensure adequate insertion depth, witness mark the pipe to the back of the flange. If conditions permit a marker pen can be used or alternatively use of a thumb is suitable. Then insert pipe to the correct depth.

4. Nut tightening

Tighten nut firmly with a wrench. Nut will not butt against the body flange when the pipe size is at the top end of the fitting tolerance.

5. Fully Installed

The fitting is fully installed when the nut cannot be tightened any further with reasonable force.

6. Disassembly

Unscrew the nut with a wrench. Pipe will be released and can be pulled out of the fitting.

- Use a pipe measuring gauge if there are doubts on pipe outside diameter (OD) size.
- Installation instructions are also applicable for the PE end.

UTC® SIZING CHART

The following chart provides a convenient means of identifying the appropriate UTC® fitting. For pipes and tubes not included in this chart, simply match the pipe's outside diameter to the appropriate UTC® body size

Guide only. Actual size is dependant on the pipe condition

	15-21 Size A	21-27 Size B	27-34 Size C	34-39 Size D	39-43 Size E	47-49 Size F	59-61 Size G
Alkathene	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
Normal Guage IRS 134	1/2"	3/4"	1"	1-1/4"			
Heavy Guage IRS 135		1/2"	3/4"	1"			
Copper - Metric	15mm	22mm	28mm	35mm	42mm		
Galvanised Iron	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
Stainless Steel	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
Metric ABS/PVC	16 & 20mm	25mm	32mm		40mm		
Imperial ABS/PVC	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	
Lead	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	
	5lb (20mm)	6lb (21.6mm)	9lb (30.6mm)	7lb (37.6mm)	16lb (41mm)	12lb (48mm)	
		7lb (23.2mm)	11lb (32.8mm)				
		9lb (25.4mm)					
	1/2"	3/4"	1"		1-1/4"		
	2lb (16mm)	4lb (25.2mm)	6lb (31mm)		9lb (39.2mm)		
	4lb (19.2mm)	5lb (26.4mm)	7lb (31.6mm)				

Fitting selection can be made easier with the use of the Philmac Pipe Guage

Copper

If user does not want to use a UTC® the copper needs to be M.I. or F.I. ended so that we can offer a Metric/Imperial fitting to suit. Same rule applies for 54mm O.D. copper. Use copper compression fitting to adapt to M.I. or F.I. anmd then use a Metric/Imperial fitting.

Lead

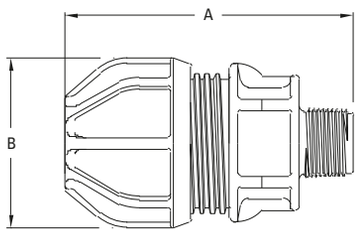
The general condition of lead pipe can make sizing difficult at top and bottom tolerance. If the recommended UTC® is not successful the next size up or down depending on the fit should be offered.

UTC® is a cold water rated fitting. It is rated at 50+ years design life at 1200kPa and 20 °C. Please consult Philmac for derating factors in excess of 20 °C

RANGE DIMENSIONS & WEIGHTS

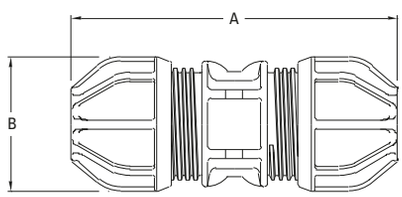
END CONNECTOR (UTC® x MI BSP)

Size (OD)	Ref No	Dimensions (mm) A	Dimensions (mm) B	Weight (kg)
15 – 21 mm UTC x ¾" MI BSP	97123200	100	54	0.080
15 – 21 mm UTC x 1" MI BSP	97123300	103	54	0.080
21 – 27 mm UTC x ¾" MI BSP	97124200	110	66	0.126
21 – 27 mm UTC x 1" MI BSP	97124300	113	66	0.130
27 – 34 mm UTC x ¾" MI BSP	97125200	122	80	0.206
27 – 34 mm UTC x ¾" MI BSP	97125300	125	80	0.208



JOINER (UTC® x UTC®)

Size (OD)	Ref No	Dimensions (mm) A	Dimensions (mm) B	Weight (kg)
15 – 21 mm UTC x 15 – 21 mm UTC	97113310	136	54	0.130
21 – 27 mm UTC x 21 – 27 mm UTC	97114410	156	66	0.216
27 – 34 mm UTC x 27 – 34 mm UTC	97115510	175	80	0.352
34 – 39 mm UTC x 34 – 39 mm UTC	97117710	180	80	0.460
39 – 43 mm UTC x 39 – 43 mm UTC	97116610	193	96	0.552
47 – 49 mm UTC x 47 – 49 mm UTC	97118810	229	96	0.828
59 – 61 mm UTC x 59 – 61 mm UTC	97119910	262	113	1.087



REDUCING JOINER (UTC® x UTC®)

Size (OD)	Ref No	Dimensions (mm) A	Dimensions (mm) B	Dimensions (mm) C	Weight (kg)
21 – 27 mm UTC x 15 – 21 mm UTC	97114310	145	66	54	0.175
27 – 34 mm UTC x 15 – 21 mm UTC	97115310	163	80	54	0.245
27 – 34 mm UTC x 21 – 27 mm UTC	97115410	166	80	66	0.289
34 – 39 mm UTC x 27 – 34 mm UTC	97115010	175	80	80	0.450
39 – 43 mm UTC x 27 – 34 mm UTC	97116510	185	96	80	0.460
47 – 49 mm UTC x 39 – 43 mm UTC	97116010	220	96	96	0.767