

CTS

Fittings

Technical Manual



IPEX

by aliaxis

CONTENTS

Benefits	2
Complete Range	3
Standards	5
System Design Considerations	6
Installation Instructions	9
Materials & Components	10
Principles of Operation	10
Threaded Fittings - Installation instructions	11
Dimensions & Weights	12

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.

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Please refer to our Terms and Conditions of sale.

EASY RELIABLE CONNECTIONS, EVERYTIME

IPEX offers an extensive range of high quality thermoplastic compression fittings for connection to CTS HDPE tubing and PEX pipe.

IPEX compression fittings for CTS pipe use Slide and Tighten™ technology to make installation simple. In addition they offer a high integrity 250psi rated connection with no corrosion or lead risk. Connections are available in ¾" and 1".



Benefits

Faster to Fit

Slide & Tighten technology: CTS compression fittings incorporate all the benefits of unique Slide & Tighten technology. 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. Simply insert the pipe into the fitting until the first point of resistance is felt, and then tighten the nut. Assembly is so easy you can even do it under live conditions. Also, there is no need to disassemble the fitting before use because CTS compression fittings are supplied pre-assembled and ready to use.

Lasts Longer

IPEX CTS fittings have a 50 year+ design life and are built to withstand the toughest conditions to ensure longevity and durability. The composite material avoids corrosion, ensuring a long service life.

Safe

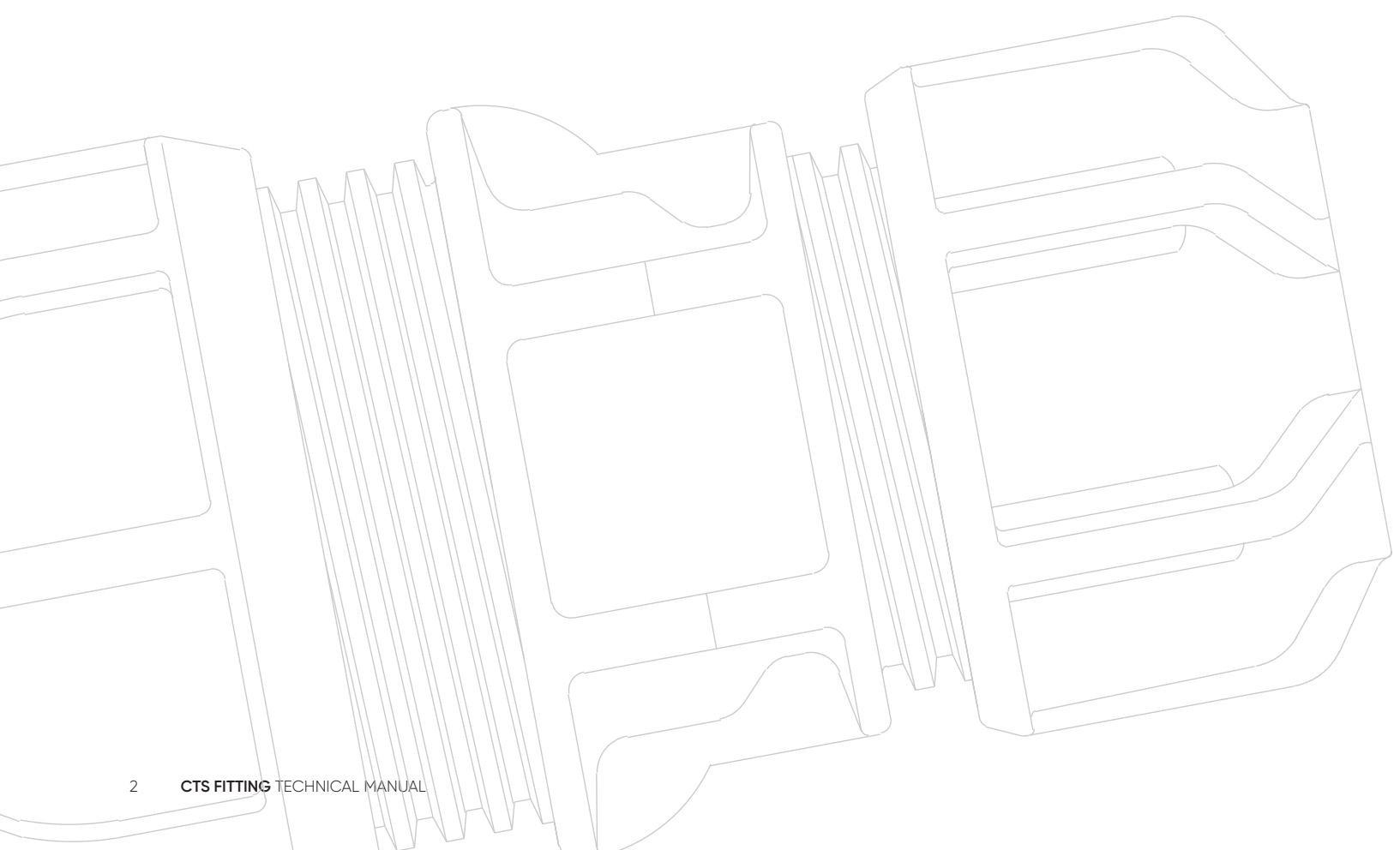
Composite construction means there is no leachate of heavy materials and it is completely free of lead.

Stops Theft

Manufactured from durable composite materials, IPEX CTS fittings have no scrap value, unlike brass fittings.

Robust and Easy

Made from advanced thermoplastic materials: CTS compression fittings are manufactured from lightweight high performance thermoplastic materials which, unlike metal fittings, resist corrosion, therefore significantly minimizing maintenance, repairs and long-term costs. The materials are non-toxic and taint-free and also offer outstanding impact, UV and chemical resistance. Easy disassembly is a key feature of the fitting has been designed so the split collet is released as soon as the nut is backed off, making disassembly easy.



Additional Features

No Loose Components

If the nut is removed there is no danger of losing components, as the collet and seal ring are retained in the body of the fitting. Losing components in the trench becomes a thing of the past.

Rated to 250psi

Compression fittings are pressure rated to 250psi to meet the needs of high pressure systems.

Designed to Minimize Twist

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

Visual Stop

The flange on the body of the compression fitting provides a visual stop to indicate when the nut is fully tightened. This removes any uncertainty from the installation process and eliminates the risk of over-tightening.

Complete Range

The CTS compression fittings range is comprehensive: tees, elbows, and male and female adapters ranging from 3/4" to 1".



Coupler
Comp. x Comp.



Male
Adapter
Comp. x MPT



Female
Adapter
Comp. x FPT



Tee
Comp. x Comp.
x Comp.



Elbow
Comp. x Comp.

THE FITTING IS
PRE-ASSEMBLED
AND READY
TO USE



Standards

The IPEX range of CTS compression fittings are approved for potable water use to CSA B137.1 and NSF61.

IPEX CTS fittings conform to the following standards:

ANSI/ASME B1.20.1,

Pipe threads, General purpose (inch).

ASTM F1498, ASTM F3536

Standard specification for tapered pipe threads 60° for thermoplastic pipe and fittings.

ASTM F3536

Standard specification for PE and PP mechanical fittings for use on NPS 3 or smaller cold-water service polyethylene (PE) or crosslinked Polyethylene (PEX) pipe or tubing.

AWWA C800

Underground Service line valves and fittings. IPEX fittings comply with the relevant dimensional and performance requirements of AWWA C800.

ASTM D2565

UV Resistance, Grade 8. fittings are rated 8 on a 1 to 8 scale.

CTS fittings are designed for connection to PE pipes and tubes manufactured to the following specifications:

ASTM D2737

Standard Specification for Polyethylene (PE) Plastic Tubing to Copper Tube Size (CTS) dimensions.

ASTM F876

Standard Specification for Crosslinked Polyethylene (PEX) Tubing to Copper Tube Size (CTS) dimensions.

ASTM F1281

Standard Specification for Crosslinked Polyethylene/Aluminum/ Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe.



System Design Considerations

Projected life of Compression fittings

Whilst IPEX CTS Compression fittings 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

To calculate head loss, fittings can be replaced with an equivalent length of pipe. The following formula is used to estimate this equivalent length of PE pipe based on the conveyance of water;

$L \text{ (feet)} = ID \text{ (inch)} \times F$
 where L = head loss based on equivalent pipe length (feet)
 ID = pipe inner diameter (inch)
 F = fitting constant

Fitting	Fitting Constant (F)
90° elbow	2.5
90° tee - straight through	1
90° tee - side branch	5

Resistance to Impact

The thermoplastic materials used in the IPEX CTS Compression fittings have excellent impact properties.

Abrasion Resistance

IPEX CTS Compression fittings are suitable for the transportation of abrasive slurries and will withstand normal conditions found in urban, mining, industrial, rural water and waste water systems.

Electrolytic Corrosion - 'Dielectric' fitting

IPEX CTS Compression fittings are non magnetizing and do not cause electrolytic deterioration.

Thermal Insulation

Polypropylene has a thermal insulation of more than 2000 times that of copper and 200 times that of steel.

Light Transmission

The IPEX CTS Compression fitting does not transmit light, thus protecting the water quality in potable water pipelines from growth of micro organisms.

Effect on Water

IPEX CTS Compression fittings do not impart to water any odor, taste, color, or any constituents in concentrations that could be injurious to health.

Temperature

CTS Compression fittings are designed for cold water applications only. Exposure to elevated temperatures has a significant impact on the lifetime of the fittings. All projected lifetimes are based on an operating temperature of 73° F (23° C)

Fluids other than Water

Many factors can affect the chemical resistance of plastics. Some of these include temperature, pressure, exposure time, continuous or cyclic expose and the type of mechanical stress applied.

The fact that certain combinations of chemicals and mechanical load can induce stress cracking in many otherwise chemically resistant materials, both metallic and non-metallic, is of particular significance.

Mixtures of chemicals can result in a performance quite different than that of each individual chemical. Equally vapors and corrosive liquids can often be combinations of chemicals.

Due to the number of parameters that influence the performance of metals and plastics in the presence of chemicals, the performance can differ from a laboratory test. IPEX strongly recommends that the final decision be based on the results of a trial installation evaluated under actual service conditions.

Evaluation Method

To evaluate the performance of IPEX fittings in the presence of chemicals, evaluate each materials used in the fitting by using chemical performance tables published by the chemical industry.

Normally only the wetted area of the fitting, ie the body and seal need evaluation. For immersed applications, the nut, split ring and spacer also need evaluation.

IPEX Assistance

To evaluate the performance of a material in the IPEX product in the presence of chemicals please contact IPEX and supply the following five parameters.

Size. What size is the valve or pipe work?

Temperature. What temperature are the chemicals? Is the temperature constant or cycling?

Application. Where and how is the fitting being used? Is the chemical on the inside or is the fitting immersed in the chemical, ie on the outside of the body rather than the inside?

Media. What chemical is being used? Is it a liquid or gas, is it one chemical or are there combinations? Are there surrounding chemicals or gases in the air?

Pressure. What pressure is being applied to the pipe and fitting? Does it vary?

Remember the **STAMP** acronym.

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 = 68°F (20°C)		

EASY RELIABLE
CONNECTIONS,
EVERYTIME



CTS – Installation Instructions



1. Cut Pipe Square

Cut the 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 fully relaxed and 2 threads are showing before inserting the pipe.



3. Pipe Insertion

Insert the pipe until the first point of resistance is felt.



4. Nut Tightening

The nut should be tightened by hand.

Tighten the nut until it just touches the flange on the body of the fitting. You may need a small turn with a wrench to achieve this.



5. Check for correct installation

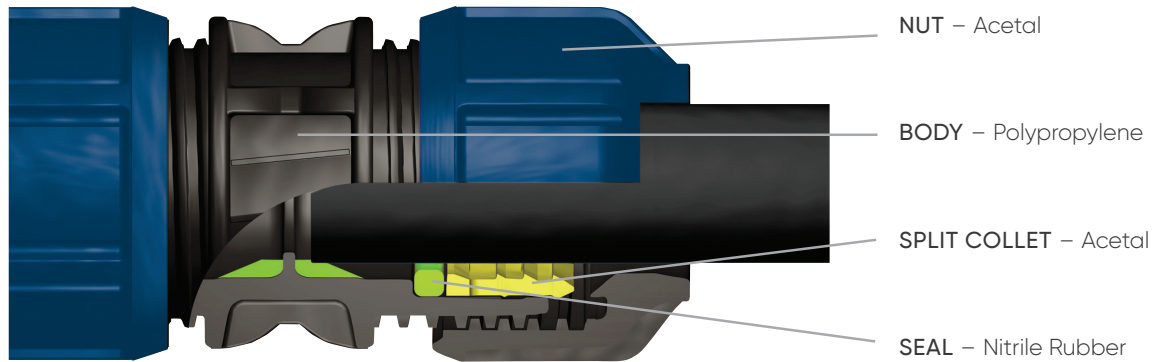
Ensure the nut is tightened until flush with the flange on the body of the fitting.
Fitting is now fully installed.



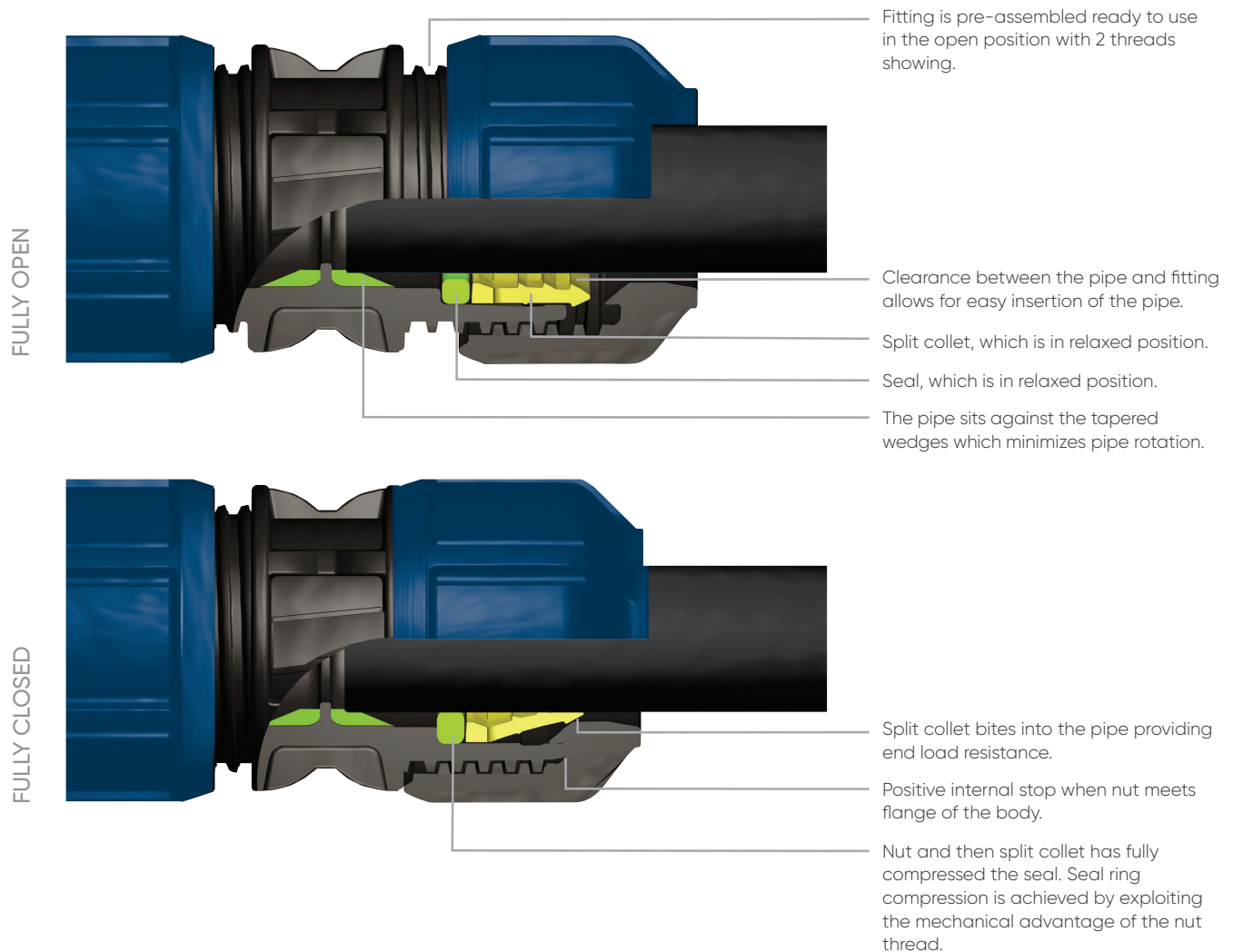
6. Disassembly

To disassemble the fitting simply loosen the nut using a wrench until 2 threads are showing. Pipe will be released and can simply be pulled out of the fitting.

Materials and Components



Principles of Operation



Threaded Fittings – Installation Instructions

IPEX CTS Compression fittings offer a range of advantages over metal threaded fittings

- **Faster, easier and reliable Installation.**
- **Less effort through lower friction**
- **Exploits the material properties of Polypropylene which reduce the installation effort compared to metal threads**

Manufactured from Engineering Plastics

IPEX threaded fitting bodies are manufactured from high performance engineering plastics which delivers significant benefits.

Less Friction

IPEX threaded fittings require significantly less effort to install through the use of high performance plastic that provides far less friction than metal on metal threads.

New Approach to Installation

IPEX CTS fittings usher in a new era of thread connection. The high performance materials conform to slight irregularities in metal threads, whereas metal to metal joints tend to bind increasing the installation effort.

Smaller Lighter tools

A simple set of adjustable pliers can be used to install an IPEX threaded fitting. Gone are the days when you need a four-foot wrench to install and tighten a threaded fitting.

Proven Performance

IPEX threaded fittings are built tough and are used world-wide by water companies, civil contractors, plumbers and in rural applications.

Example – Male Adapter into a metal valve



1. Apply PTFE tape or suitable* sealant to the plastic thread ensuring sufficient is applied to ensure a watertight seal.



2. Using your hands, screw the thread of the Male Adapter into the valve until firm.



3. Grip the body of the fitting with adjustable pliers or similar plumbing tools and continue to screw the Male Adapter into the valve until tight.

Stop if the shoulder of the fittings touches the other fitting.

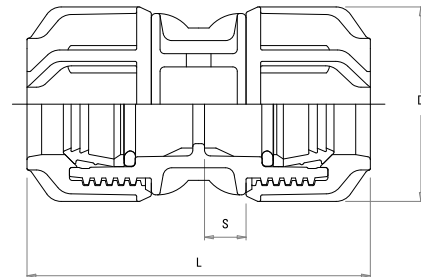
* Note: IPEX recommends the use of PTFE tape on threads to ensure a positive seal. If a liquid or paste sealant is used, ensure it is suitable to be used with both Polypropylene and the material being connected to the IPEX fitting.

Dimensions & weights

CTS fittings for PE Water Service Tube and PEX to CTS dimensions (suits PE to ASTM D2737)

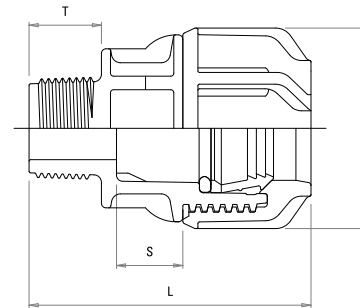
COUPLERS (Comp. X Comp.)

IPEX Code	Size	Dimensions				Wt
		S	D	L		
258401	3/4 in. x 3/4 in. (19.05 mm x 19.05 mm)	0.39 in. (9.91) mm	1.85 in. (47) mm	5.55 in. (141) mm.		0.18 lbs. (0.08) kgs
258400	1 in. x 1 in. (0.45 mm x 0.45 mm)	0.43 in. (10.92) mm	2.17 in. (55.12) mm	3.82 in. (97.03) mm		0.26 lbs. (0.12) kgs.



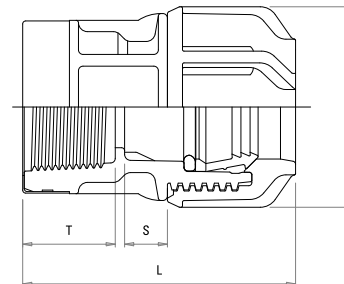
MALE ADAPTORS (Comp. x MPT)

IPEX Code	Size	Dimensions				Wt
		S	D	L	T	
258406	3/4 in. x 1/2 in. (19.05 mm x 12.7 mm)	0.67 in. (17.02) mm	1.85 in. (47) mm	2.88 in. (73.15) mm.	0.78 in. (19.81) mm.	0.10 lbs. (0.05) kgs
258407	1 in. x 3/4 in. (0.45 mm x 19.05 mm)	0.75 in. (19.05) mm	2.17 in. (55.12) mm	3.23 in. (82.04) mm	0.83 in. (21.08) mm	0.16 lbs. (0.07) kgs.



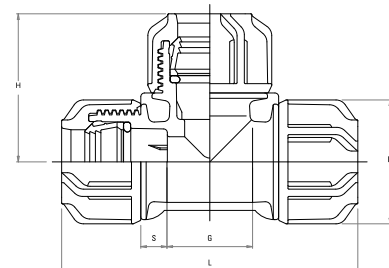
FEMALE ADAPTORS (Comp. x FPT)

IPEX Code	Size	Dimensions				Wt
		S	D	L	T	
258408	3/4 in. x 1/2 in. (19.05 mm x 12.7 mm)	0.39 in. (9.91) mm	1.85 in. (47) mm	2.71 in. (68.83) mm.	0.90 in. (22.86) mm.	0.12 lbs. (0.05) kgs
258409	1 in. x 3/4 in. (0.45 mm x 19.05 mm)	0.43 in. (10.92) mm	2.17 in. (55.12) mm	2.80 in. (71.12) mm	0.95 in. (24.13) mm	0.17 lbs. (0.07) kgs.



TEES (Comp. X Comp. X Comp.)

IPEX Code	Size	Dimensions					Wt
		S	D	H	G	L	
258404	3/4 in. x 3/4 in. x 3/4 in. (19.05 mm x 19.05 mm x 0.45 mm)	0.39 in. (9.91) mm	1.85 in. (47) mm	2.32 in. (58.93) mm	1.22 in. (31) mm	4.61 in. (117.09) mm.	0.37 lbs. (0.08) kgs
258405	1 in. x 1 in. x 1 in. (0.45 mm x 0.45 mm x 0.45 mm)	0.43 in. (10.92) mm	2.17 in. (55.12) mm	2.64 in. (67.06) mm	1.58 in. (40.13) mm	5.28 in. (134.11) mm	0.43 lbs. (0.13) kgs.



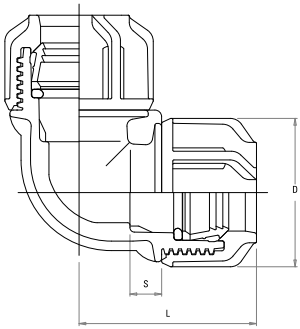
1 CTS is cold water rated fitting designed for Water Service Tube. It is rated at 50+ year design life at 250psi and 73 °F (23 °C), please consult IPEX or a local representative for de rating factors in excess of 73 °F (23 °C),.

Dange dimensions & weights

CTS fittings for PE Water Service Tube and PEX to CTS dimensions (suits PE to ASTM D2737)

ELBOWS (Comp. X Comp.)

IPEX Code	Size	Dimensions			Wt
		S	D	L	
258402	3/4 in. x 3/4 in. (19.05 mm x 19.05 mm)	0.39 in. (9.91) mm	1.85 in. (47) mm	2.32 in. (58.95) mm.	0.18 lbs. (0.08) kgs
258403	1" x 1" (0.45 mm x 0.45 mm)	0.43 in. (10.92) mm	2.17 in. (55.12) mm	2.64 in. (67.06) mm	0.29 lbs. (0.13) kgs.



1 CTS is cold water rated fitting designed for Water Service Tube. It is rated at 50+ year design life at 250psi and 73 °F (23 °C), please consult IPEX or a local representative for de rating factors in excess of 73 °F (23 °C),.



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