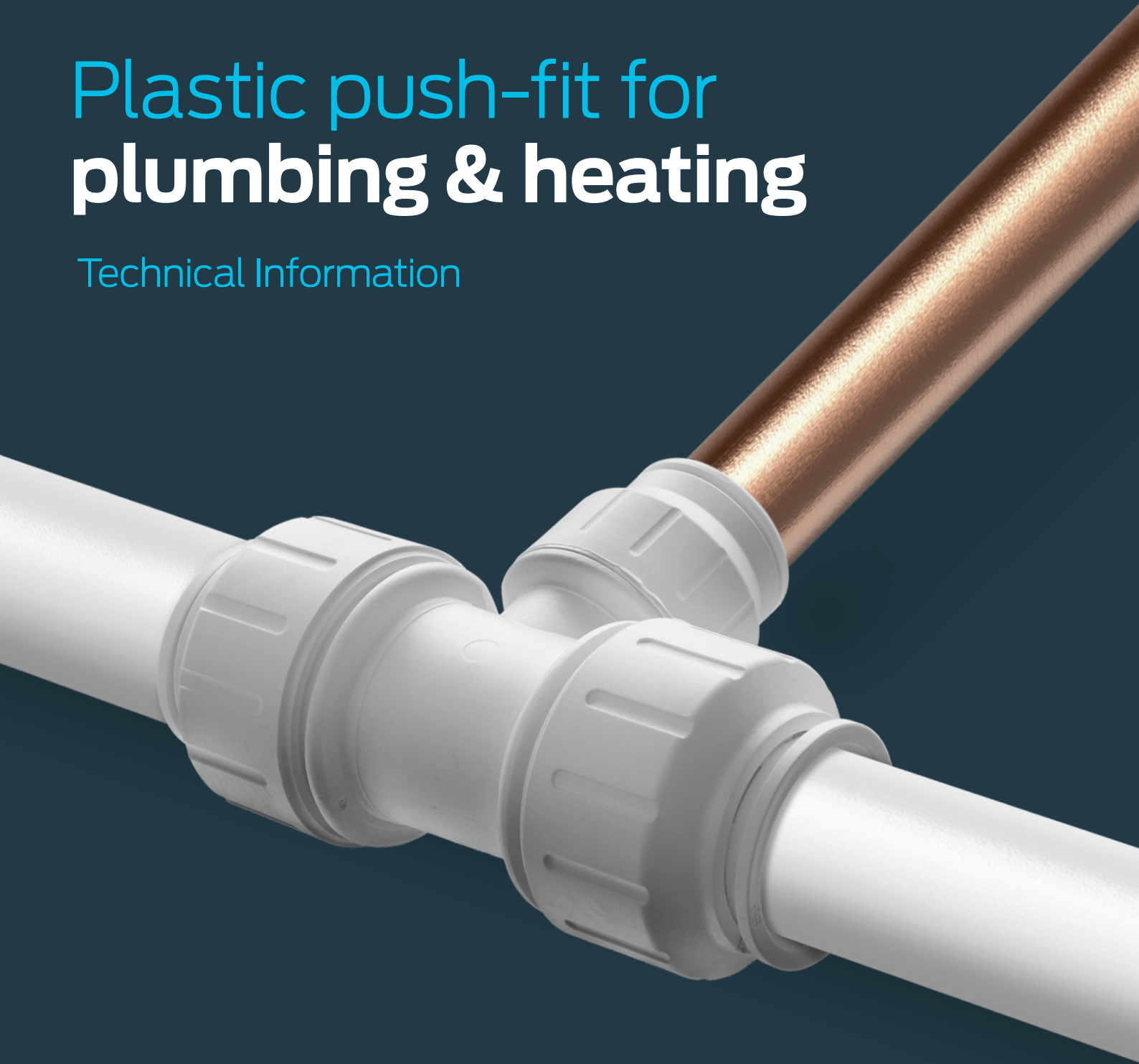


# Plastic push-fit for plumbing & heating

Technical Information



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# JG Speedfit plumbing and heating systems

JG Speedfit is a push-fit system suitable for the plumbing of domestic hot and cold water services and central heating applications, including pressurised and combi systems.

The System is approved by the Water Regulations Advisory Scheme. Speedfit 'PEM' fittings and PEX and Polybutylene Barrier Pipe are Kitemarked to BS7291 Parts 1, 2 and 3 Class S Licence No KM39767.

Performance specifications are well within those required for most central heating and water supply systems including:

- Mains fed and indirect cold water systems
- Vented and unvented hot water systems
- Vented central heating systems
- Sealed central heating systems provided temperatures and pressures comply with

BS7291 Parts 1, 2 and 3 Class S

- Underfloor heating

Extensive tests have shown that Speedfit products will withstand temperatures and pressures well in excess of normal working conditions.

Speedfit should be installed to conform with good plumbing practice.

**Speedfit should not be used for gas, fuel oil or compressed air applications.**

## Special applications

**Boats.** The flexibility of the Speedfit system ensures it can be cabled easily around the interior and hidden from view.

**Caravans.** Speedfit is ideal for caravan installations due to its flexibility and its resistance to corrosion and freezing.

**Exhibitions.** The unique ability of the Speedfit system to be easily demounted and reused, together with its flexibility, makes Speedfit ideal for this application.

**Agricultural and Horticultural.** Speedfit has many applications in agricultural and horticultural environments.

**Portable Buildings (site cabins, toilets).** As with caravans, Speedfit is well suited to this application.

## Working temperatures and pressures

Application	Usual working temperature °C	Maximum working temperature °C	Maximum working pressure, bar
<b>Cold Water</b> (indirect and direct mains)	20	20	12
<b>Central Heating</b>	82	105, short term malfunction at 114	3
<b>Hot Water</b> (including unvented cylinders)	65	95	6

Speedfit fittings suitable for central heating systems can withstand temperatures up to 114°C intermittently for short periods.

Speedfit fittings shown as not suitable for central heating systems are used primarily on the domestic hot and cold water system accepting temperatures of up to 65°C.

## Handling fittings and pipe

Ensure fittings and pipe are kept clean at all times by keeping them in bags and boxes provided. Do not empty Speedfit products onto the floor area. Ensure internal O-Ring seals are kept free from dirt and debris.

## Product selection and installation

John Guest fittings and related products are specifically designed and manufactured by John Guest to the Technical Specifications set out in this guide.

All John Guest fittings and related products should be selected, used and maintained in accordance with these Technical Specifications.

It is the customer's / user's responsibility to ensure that John Guest fittings and related products are suitable for their intended applications, are properly installed and maintained and are used in accordance with the Technical Specifications. It is also the customer's / user's responsibility to provide it's own customers with any relevant technical information about John Guest products it supplies them.

John Guest produce a push-fit system of pipe and fittings for compressed air situations. See separate literature for details.

# Plumbing and heating

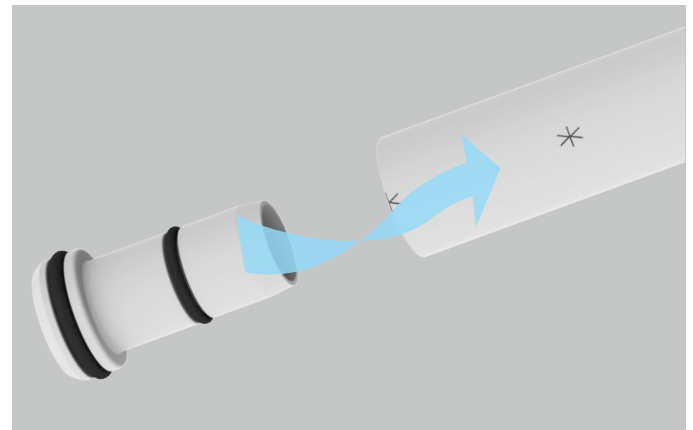
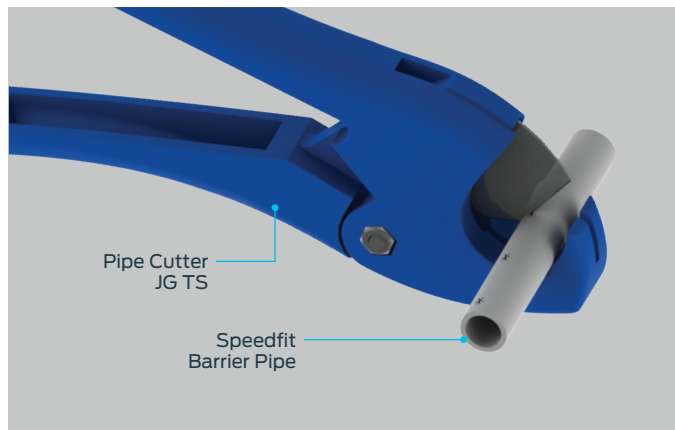
## - making a good connection

### Prepare the pipe

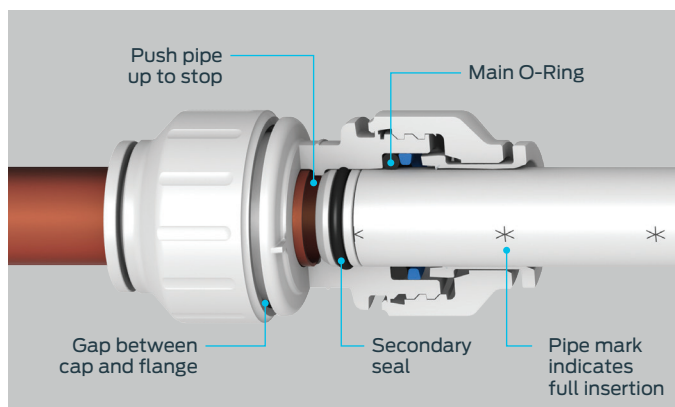
Fittings and pipe should be kept clean bagged and undamaged before use.

Ensure the pipe is free of score marks. Cut the pipe square. When using Speedfit Barrier Pipe cut along an insertion mark. We recommend the use of JG Pipe Cutters.

To prevent damage to the O-Ring remove all burrs and sharp edges. When connecting Speedfit pipe use a Superseal Pipe Insert or a Standard Speedfit Pipe Insert. Fully insert using a twisting motion. The insert should only be used with Speedfit Pipe.

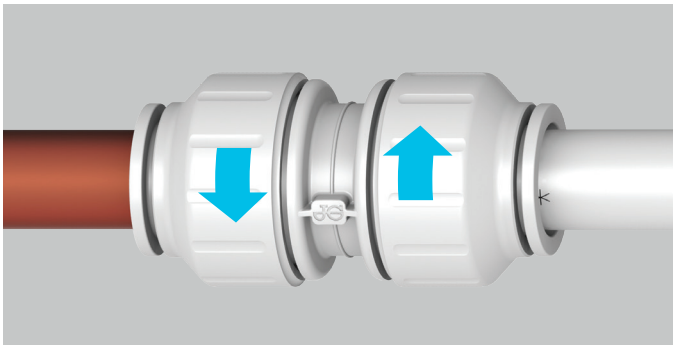


### Twist & Lock fittings

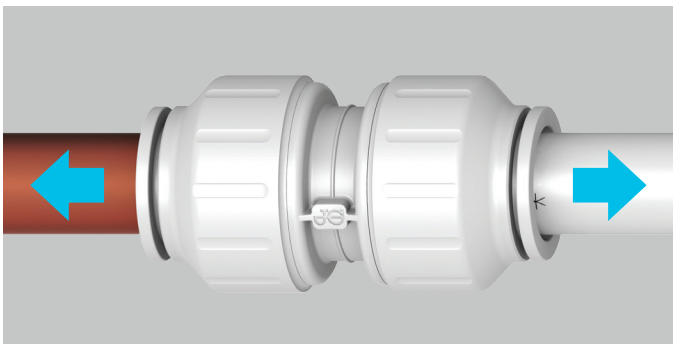


The fitting should be in the 'unlocked' position, this is shown with a small gap between the screwcap and the body flange.

Push the pipe fully into the fitting, up to the pipe stop. If the Speedfit pipe has been cut correctly the insertion mark on the pipe will be level with the collet head. The O-Ring on the Superseal Pipe Insert provides a secondary seal against the bore of the fitting. A good connection has been made.

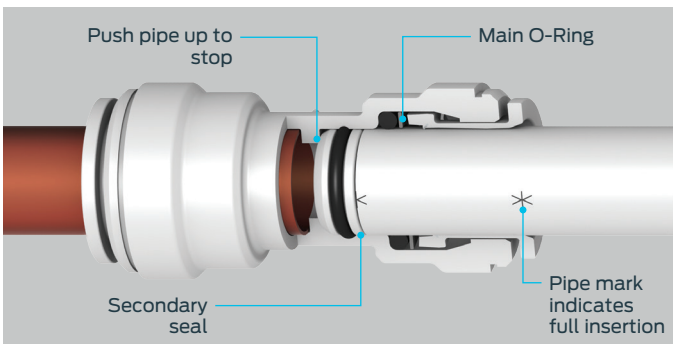


Twist the screwcap until it touches the body flange. This increases the O-Ring seal around the pipe and locks the pipe into position.



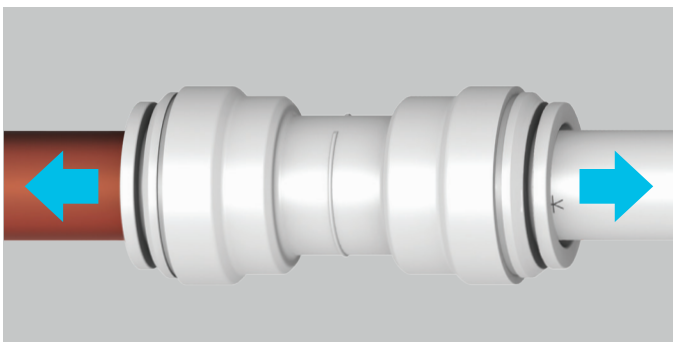
If you are not using collet clips, ensure that the screwcaps are in the locked position. Pull to check it is secure. It is good practice to test the system prior to leaving the site or before use. Our recommended test procedure is shown in our Technical Checklist.

## Standard Speedfit fittings



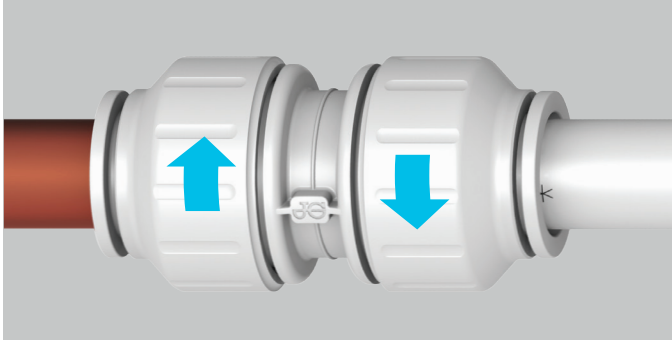
Standard Speedfit connections are made in the same way as Twist & Lock.

Push pipe up to Pipe Stop. If the Speedfit pipe has been cut correctly the insertion mark on the pipe will be level with the collet head.



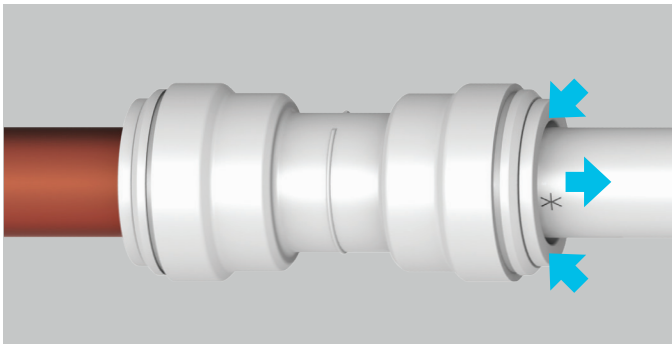
Pull to check connection is secure and test the system. Our recommended test procedure is shown in our Technical Checklist on page 23.

## To disconnect

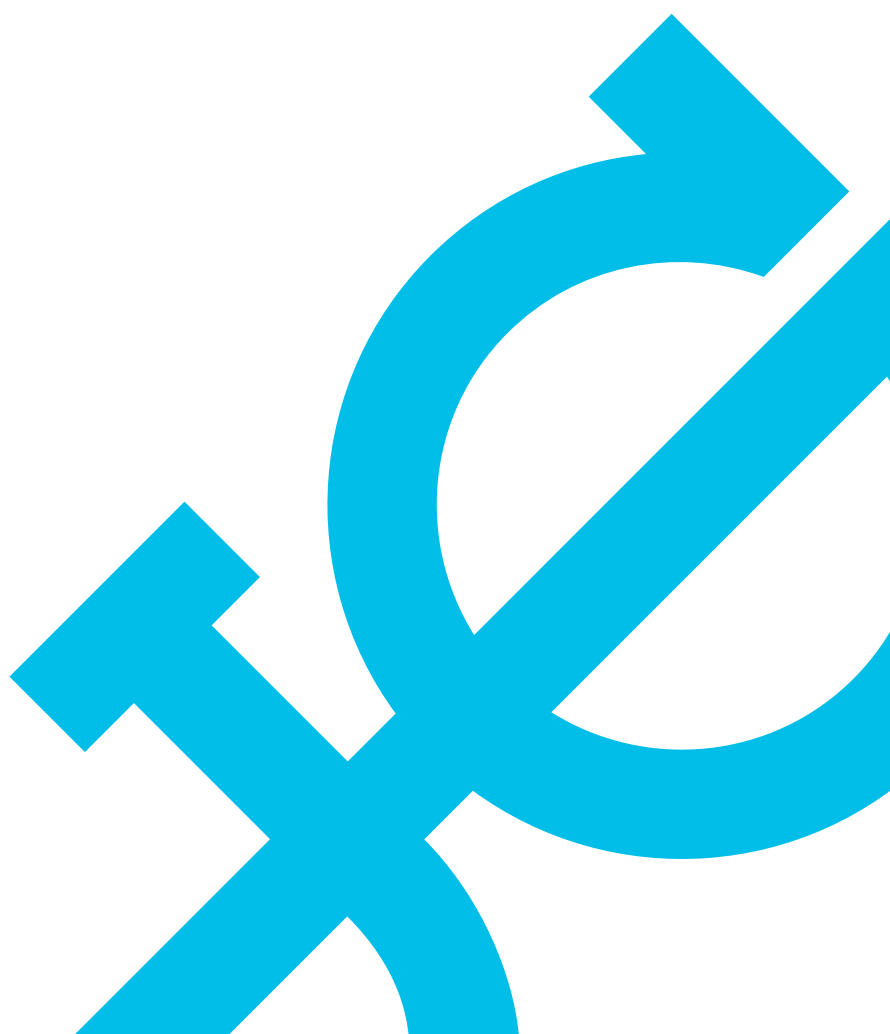


**Ensure that the system is depressurised.**

The screwcap on Twist & Lock fittings will need to be turned back to the unlocked position.



For both Twist & Lock and standard fittings, push the collet square against the face of the fitting. With the collet held in position the pipe can be removed. The fitting can be used again without the need for replacement parts.

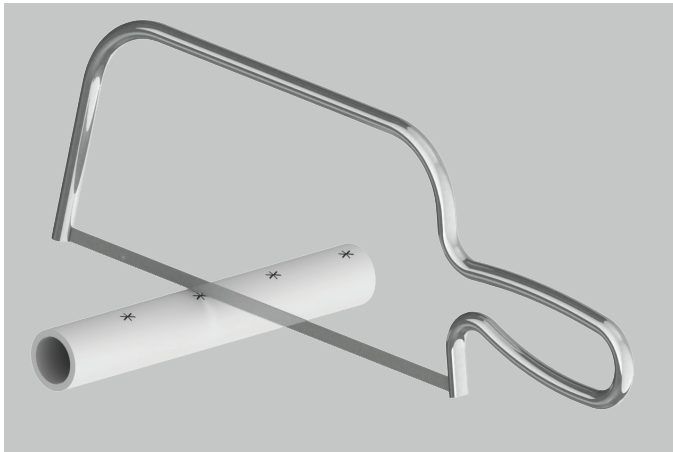


## What not to do



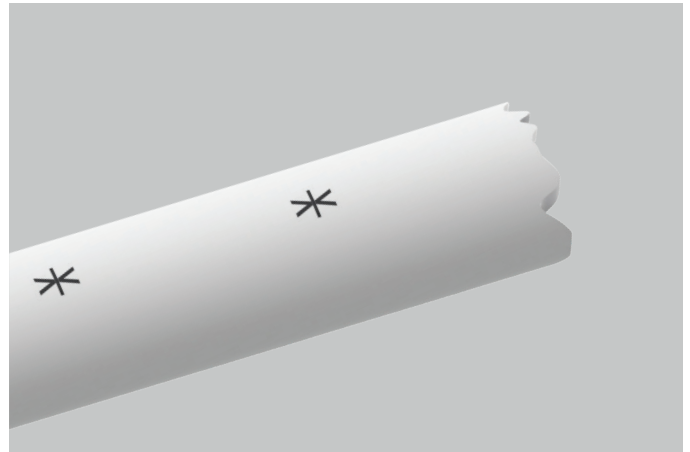
### Don't

Use hacksaws to cut the pipe or leave burrs on the end of the pipe.



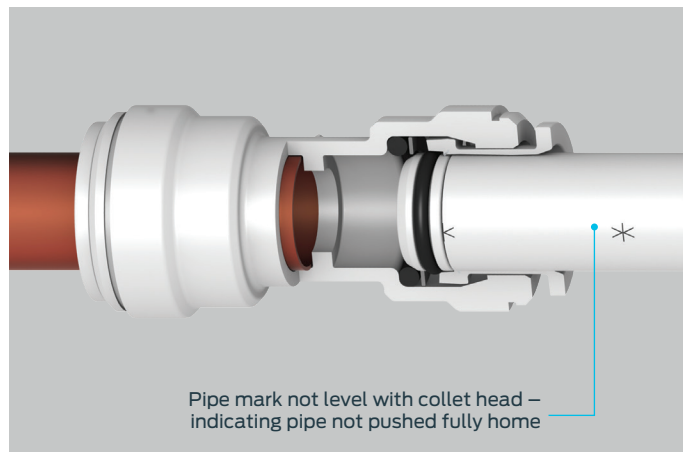
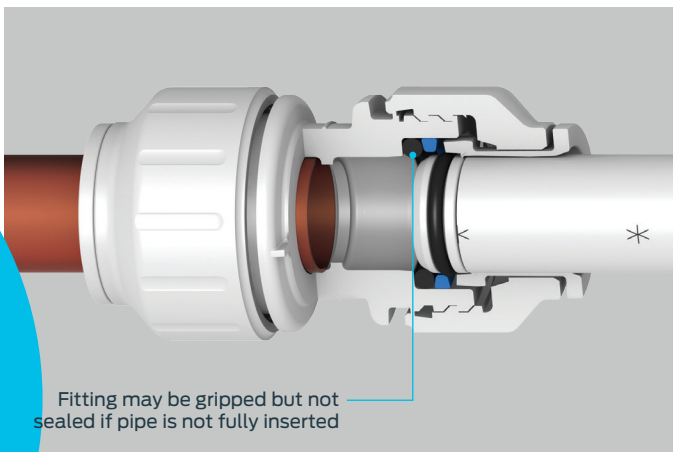
### Don't

Use damaged or scored pipe. Score marks can cause leaks passed the O-Ring.



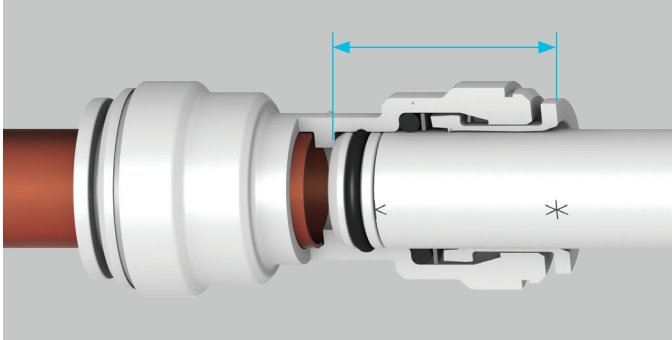
### Don't

Don't forget to push the pipe fully into the fitting, past both the collet (gripper) and the O-Ring.



 Remember to pressure test the completed installation according to the recommendations in our Technical Checklist.

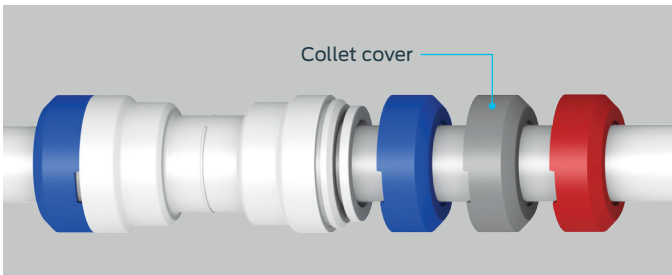
## Pipe stop distances



Stops are located at the following distances from the end of the fitting:

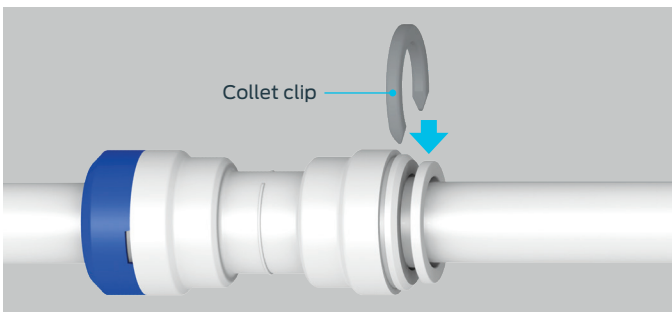
Size	Stop distance
10mm	20mm
15mm	30mm
22mm	35mm
28mm	44mm

## Collet covers and collet clips

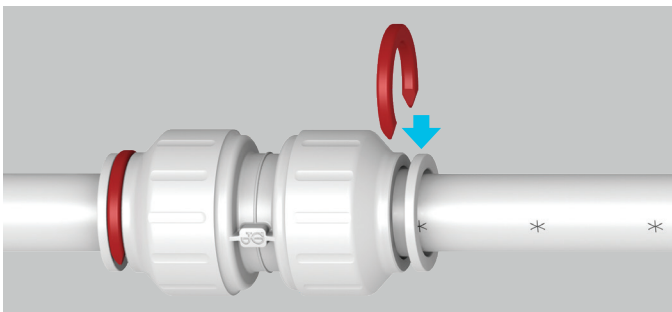


Use a collet cover or collet clip to provide added security against pipe disconnection, e.g. the fitting coming into contact with rigid surfaces and behind dry-lining walls.

Collet covers for use with standard Speedfit fittings, are available in white, red or blue to allow colour coding of pipes.



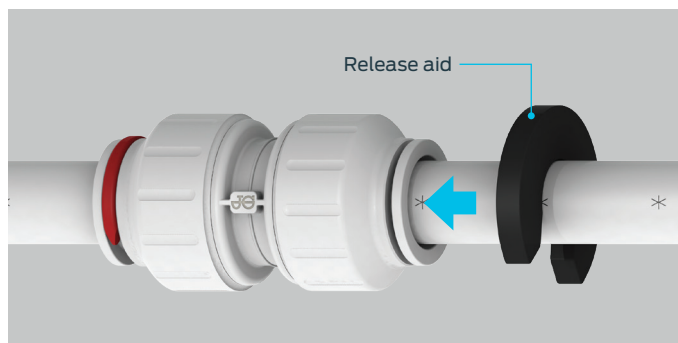
White or grey collet clips are used with standard fittings to prevent accidental pipe disconnection.



Red or blue collet clips provide colour coding of pipe on Twist & Lock fittings. They are not designed to prevent accidental release and should be fitted when the fitting is in the locked position.



## Release aid



The action of pressure in a system could increase the grip of the collet. The release aid allows a firmer grip on the collet whilst removing the pipe.

## Stop end



The unique feature of the Speedfit concept, the ability to disconnect the fitting should you want to, means the Speedfit Stop End not only provides a permanent leakproof seal, but can be readily removed to allow work to restart or to allow an extension to a system. Thus, the fitting is especially useful to allow water to be turned back on, overnight for instance, or if a job has to be interrupted for another reason.

Stop ends are also useful when pressure testing a system before appliances are connected.

## Stem elbow



Designed to simplify pipe connection in restricted spaces. The Speedfit Stem Elbow provides an instant swivel fitting so pipe can be orientated in any direction.

A special 10mm version gives a neat connection from concealed plumbing to a radiator.

## Service valves



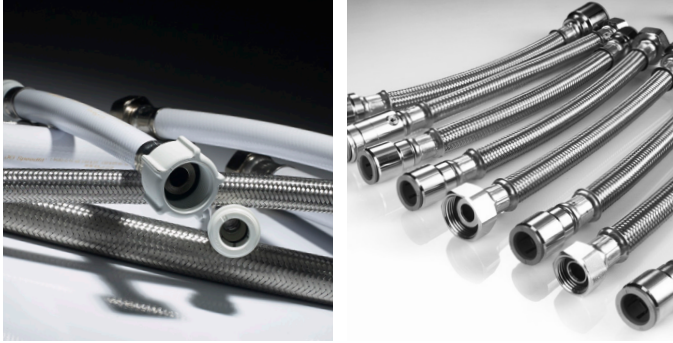
Speedfit x Speedfit  
Mechanism twists out of sight

The Speedfit range of brass chromium plated service valves can be used on both hot and cold water services and central heating. Push-fit connections mean much reduced installation time, especially in confined spaces.

The valves, in 10 to 22mm, have a 1/4 turn open/close mechanism operated by a screwdriver slot or a lever.

The ability of Speedfit products to twist whilst in-situ allows the screwdriver slot operating valve to be turned out of sight, helping to avoid unauthorised tampering.

## Flexi hoses



Manufactured to a quality you would expect from Speedfit, our range of Flexi Hoses has nearly 50 different patterns.

A special pattern has been designed to help the installation of monoblocs, each hose in a pair having a different spanner location to ease connection of the threaded end into the monoblocs inlets.

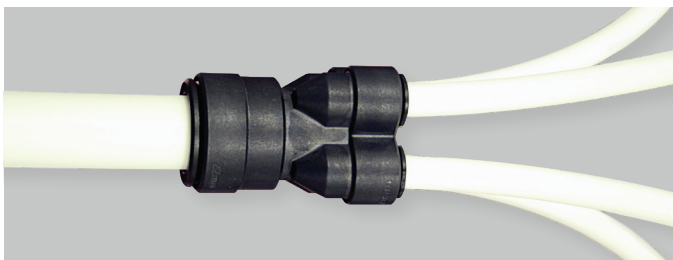
## Tap connectors



Speedfit manufactures a wide range of connectors including conventional straight and bent tap connectors.

The range also offers a special and unique Tap Connector with an integral seal that only requires a simple hand tightening to connect up a terminal tap, mixer or a float valve. The connectors are useful when replacing existing brassware or in other confined spaces.

## Speedfit manifold



Speedfit have introduced an innovative 22mm x 10mm 4 Way Manifold. Departing from the usual manifold design, this new product has 4 in-line 10mm outlets, offering a neater envelope size and therefore a much smaller installation space.

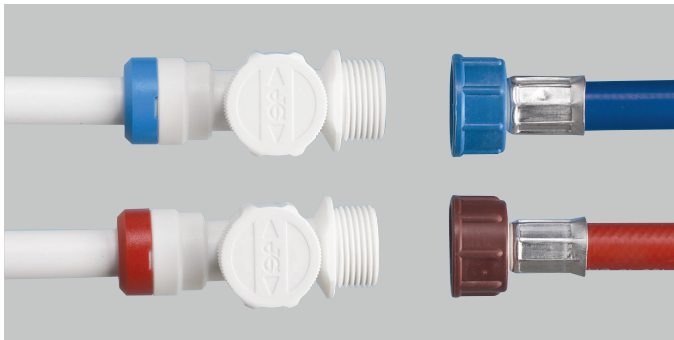
Other benefits include better flow characteristics and a more even distribution of hot water.

The 22mm and 10mm Speedfit push-fit connections make for a fast and easy installation, even in confined spaces.



Whilst designed as heating product, the manifold can also be used in a mains pressure hot or cold domestic plumbing system, to feed bathroom or kitchen taps and mixers. This allows for a more efficient installation as every terminal fitting has its own dedicated supply.

## Appliance taps



The Speedfit range includes an Appliance Tap for the permanent connection of washing machines and dishwashers, thus enabling complete water isolation to the appliances.

A simple push-fit connection of the supply pipe and a plastic thread on the outlet to marry well with the plastic thread on the hose means the Speedfit Appliance Tap is very easy to install. The large round handle is easy to grip and turn.

## Superseal pipe insert



The Superseal Pipe Insert has been developed to be used with Speedfit Barrier Pipe and Speedfit fittings to provide an extra line of defence when installing a Speedfit push-fit system.

The insert has its own O-Ring which together with a stem sliding within the inside diameter of the pipe gives a secondary seal against the inside of the fitting.

The Speedfit connection, when made with the insert, has a number of design features.

Sliding the stem of the insert into the pipe gives greater rigidity to the length of pipe within the fitting, reducing the chances of leaks if a side load is applied.

A connection is easier to make because the head of the insert has been designed for ease of insertion.

## Fittings for cold water services

### Above and below ground

This range of fittings for MDPE Pipe uses a Speedfit collet with stainless steel teeth to provide extra grip on the pipe and has WRAS Approval.



#### Application

Speedfit underground fittings for MRS PE80 metric size polyethylene cold water service pipe have been designed for connection of:

1. Blue pipe to BS EN 12201-2, 20mm PN16, 25mm and 32mm PN12.5.



Making the connection could not be easier. All you need is the pipe, the fitting and a pair of hands. The range is designed to provide a long service life and includes adaptors for screwed pipe, copper and imperial sized LDPE.



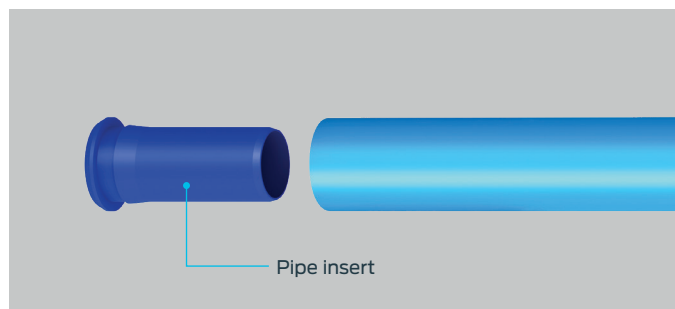
The Technical Checklist for Cold Water Services Fittings is on page 24.

# Cold water services

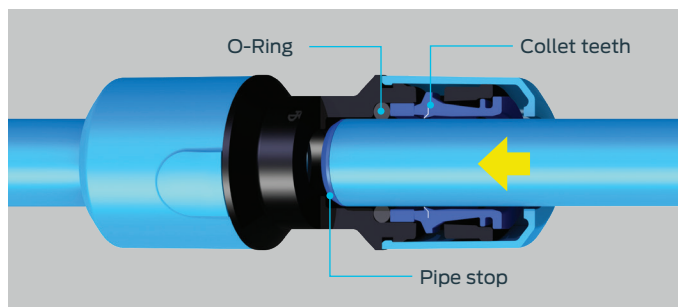
## - making a good connection



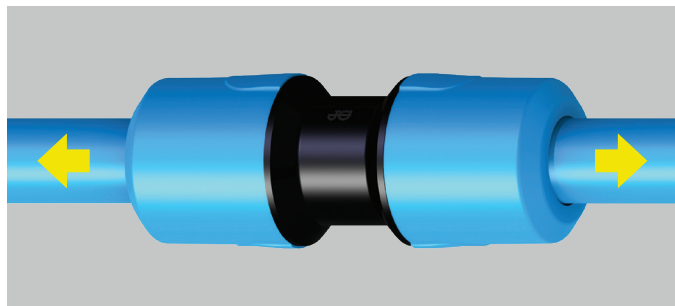
- 1** Cut pipe square using pipe cutters remove burrs and sharp edges.



- 2** Always use a Speedfit Pipe Insert, which must be fully inserted.

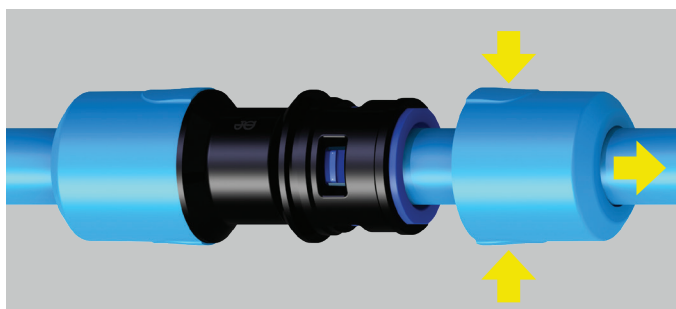


- 3** Push the pipe into the fitting, up to the pipe stop. The stainless steel teeth grip the pipe, the O-Ring provides a permanent leakproof seal.

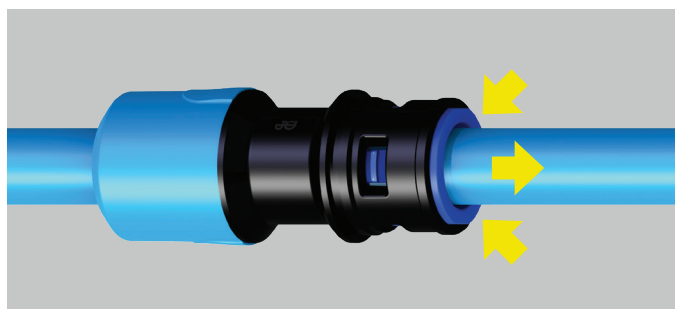


- 4** Pull to check the system is secure then test the system to ensure it is water tight.

## To disconnect



- 5** Ensure the system is depressurised. Remove the collet cover by sliding it along the pipe. Squeezing the raised portions will aid removal.



- 6** Push the collet square against the fitting. With the collet held in this position, the pipe can be withdrawn.

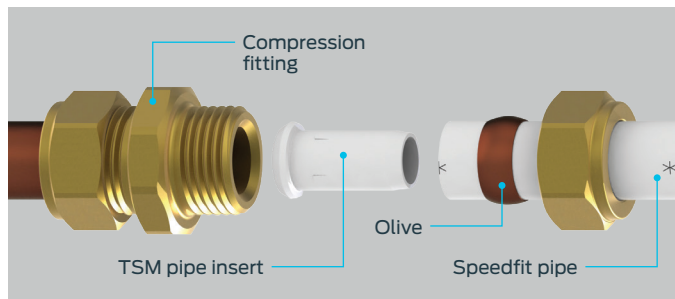
# System connections

## Connection to compression fitting

Many but not all compression fittings are suitable for use with plastic fittings and pipe. Users should therefore check for compatibility. Compression fittings with short tube stop depth or brass olives should not be used with plastic fittings or pipe.

When using compression fittings with Speedfit pipe, a Standard Pipe Insert (prefix TSM) must be used to withstand the compressive pressure of the olive. The olive must be located within the length of the pipe insert and the pipe fully inserted into the fitting. The connection should not need more than 2 full turns after the olive has gripped the pipe. JG Speedfit recommends the use of soft copper olives.

**Ensure nut and olive are in place before inserting pipe insert.**

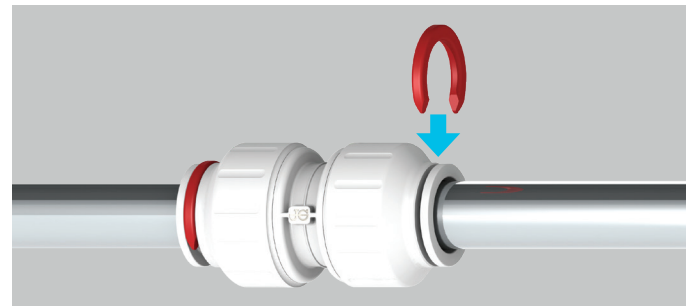


## Connection to imperial pipe and fittings

The Speedfit Range includes couplers to connect Speedfit Pipe to 1/2" to 1" BSP and BSPT.



## Connection to chrome-plated copper pipe



Speedfit fittings can be connected onto chromium plated copper pipe if the chromium plating is completely removed to the full depth of the fitting. To ensure maximum grip we recommend fitting a collet clip.

**It is not possible to connect Speedfit fittings to stainless steel pipe.**

## Connection to mains supply

In modern properties, water enters a building usually in blue MDPE (medium density polyethylene) pipe. In order to comply with Water Regulation Schedule 2.10, the internal plumbing system should be connected via a Speedfit Stop Tap from our Cold Water Services Range, Part No:s UGSTV2515, 25mm x 15mm or UGSTV2522, 25mm x 22mm.

Connection of Speedfit pipe to supply pipe of other materials should be via a stop tap with a 15mm or 22mm compression outlet.

## Connection to boilers

**Speedfit pipe should never be connected directly to a boiler.**

Although most modern boilers have a high limit thermostat, residual heat can be conducted by the heat exchanger. Therefore, Speedfit recommend a minimum of 1 metre from the boiler casing should be run in copper pipe unless otherwise stated in the boiler manufacturer's installation literature.

A gravity primary circuit operating on an uncontrolled cooking range or solid fuel boiler should be run entirely in copper and the heating circuit run in copper for the first metre. Refer to BS 5955: Part 8 for further clarification.

All appliances should have safety devices to make sure they cannot operate above the working temperature and pressure range set out in our Technical Checklist on page 23. If safety devices are not incorporated within the appliance then external controls will be needed.

Water meters (and other devices) can contain check valves that prevent the expansion of heated water back down the main supply from a combi boiler. If plastic pipe is to be used, a suitable expansion vessel must be fitted. This is especially important to consider if a water meter is fitted retrospectively. Speedfit do not recommend the use of plastic pipe on the main supply between a water meter and a combi boiler if an expansion vessel is not fitted.

Speedfit products should not be fitted to a sealed system oil boiler, a back fired boiler or other uncontrolled heat source.

Please also see Drop-pipe systems on page 16 and System commissioning and flushing on page 21.

## Continuously operated re-circulating systems (secondary hot water circulation/ ring main installations)

A continuously operated re-circulating system is a water-replenished circulating system which is maintained at a constant high temperature to provide a constant source of hot water. Continuously operated re-circulating systems are used to distribute constant hot water to draw off points that may be distant from the source or hot water storage vessel.

Continuously operated re-circulating systems are very different from conventional hot water supply and central heating systems found in domestic properties, for which our products have been tested to, under either BS7291:2010 Class S or WRAS approval standards, and for this reason Speedfit products must not be used on any continuously operated re-circulating systems as they are not approved under the current version of these standards.

## Unvented pressurised cylinders

Unvented pressurised cylinders can be installed using Speedfit pipe and fittings. However if the safety parameters of the cylinder exceed those of the pipe and fittings it is possible to fit a pressure reduction valve on the out going hot supply pipe. This will not interfere with any other cylinder safety devices demanded by regulations as they are all fitted in the incoming side of the cylinder.

Run a short length of copper pipe from the cylinder connection (about 150mm – 300mm) then fit a suitable pressure reduction valve. This will protect the pipe and fittings from excessive pressure in the event of boiler/cylinder malfunction. The factory fitted temperature/pressure relief valve on the cylinder will discharge below 100°C therefore protecting the pipe from excessive temperature.

## Connection to cylinders and water heaters

Speedfit can be used on sealed and open vented heating systems, where boilers are either heating a hot water storage cylinder or instantaneous hot water such as a combination boiler. The temperature and pressure limits of the system must not exceed the maximum values stated under the heading 'Working Temperatures and Pressures'.

When using a traditional copper vented cylinder Speedfit pipe and fittings can be installed with direct connections to the cylinder. Unvented pressurised cylinders can be installed using Speedfit pipe and fittings. However, insertion depths on compression joints that form part of the cylinder must be checked prior to installation and the use of standard pipe inserts (Prefix TSM) is recommended.

Speedfit connections to combined cylinder/boiler units and thermal storage units must be made outside the casing unless otherwise stated in manufacturers installation literature.

## Drop-pipe systems

Care should be taken when designing and installing a central heating system where radiators are supplied by pipe work which drops from an upper floor.

With this kind of system it is possible to trap air in the upper floor pipe work. When the boiler is fired the increase in pressure within the pipe caused by expanding air could cause the pipe to burst.

It is therefore essential that the system be designed so that any air can be removed from the system either automatically or manually by installing automatic or manual air vents at the highest points of the system.

## Connection to pumps and valves

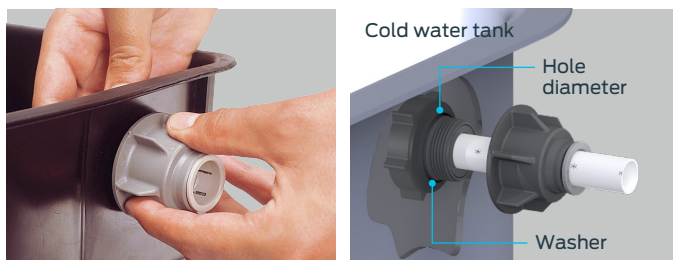
Speedfit pipe should be connected to circulating pumps and motorised valves in accordance with page 15, 'Connecting to compression fittings'. If Speedfit pipe is not mounted on a supporting structure, the pipe must be clipped close to the component's connections to ensure adequate support and to assist in the reduction of vibration.

For heavier equipment, ensure that appropriate metal brackets provide full and independent support of the components and that it does not rely solely on the pipework for support.

## Connection to copper pipe

The minimum distance to make a solder connection on copper pipe inserted into a Speedfit fitting is 450mm (18 inches). Ensure that any residual flux solder is not allowed to come in contact with the fitting. That same measurement is the safe distance to use a freezer kit to Speedfit pipe.

## Connecting to cold water storage tank



Pipe	Hole diameter
15mm pipe	29mm
22mm pipe	36mm
28mm pipe	46mm

To install the Speedfit Tank Connector, unscrew the nut and push the body of the fitting through the tank hole with the washer on the inside of the tank. Hand tighten the nut onto the body. Push the pipe into the connector.

**Note: Hand tightening the nut onto the body is all that is required. Further mechanical tightening will damage the fitting.**

## Preventing back flow



The Speedfit range includes a Double Check Valve (Part No 15DCV) to enable installers to comply with Water Regulation Schedule 2.15, thus preventing contamination of water arising from back siphonage, backflow or cross connection. Suitable for use with fluid categories 1, 2 and 3 only.

## Radiator connections

The most common way of running pipework to a radiator is to run both flow and return pipes central to the radiator position.

The pipes exit a single gang box (fitted with rubber grommets) located at the mid height of the finished radiator position. This also provides a fixed point for other trades to work to and reduces the risk of damage to the pipework.

Once the plasterboard is installed the pipes are passed through the Speedfit Radiator Outlet Plate to exit plasterboard without the need of unsightly holes.



Metal reducing sets which convert radiator valves from 15mm to 10mm are not suitable for use with Speedfit fittings or pipe as they can cause damage to the plastic.

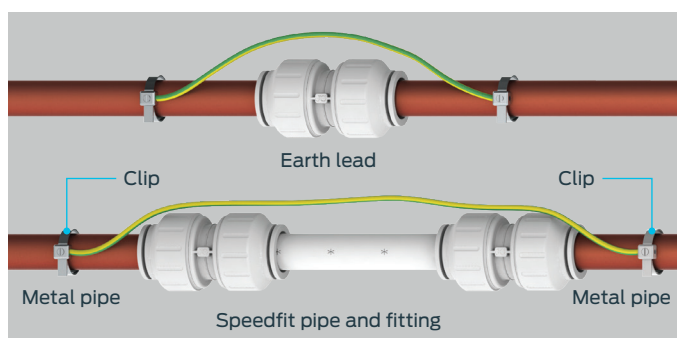


## Electrical continuity

The plumbing or heating system installer should have these aspects checked to ensure compliance with current IEE Regulations. If in doubt please contact the Speedfit Technical Advisory Service or consult your local Electricity Authority.

IEE Guidance Note 7 provides useful guidance on the design of electrical installations where there is increased risk of electric shock. It recognises that the requirement for supplementary bonding may be relaxed where metal taps and plastic pipes supply other bathroom fittings.

Similarly a metal bath or radiator not connected to an extraneous-conductive-part is not required to be connected to the local supplementary conductors.



## Supplementary bonding to bathrooms

Pipe material	Supplementary bond required between	Comments
Cold water Hot water Central heating		
P P P	Earth terminals of protective conductors of class I and of class II equipment and accessible exposed conductive parts of the building structure.	Bonding of metal taps metal radiators or metal baths is not required unless the bath is connected to the metallic building structure.
P M M	Hot water pipe, central heating pipes, earth terminals of protective conductors of class I and class II equipment and accessible exposed conductive parts of the building structure.	A bond is not required to the taps either hot nor cold, or to metal baths unless connected to the metallic building structure.
P P M	Central heating pipes, the earth terminals of protective conductors of class I and class II equipment and access to exposed conductive parts of the building structure.	Bonding of metal water taps is not required, nor metal baths unless connected to the metallic building structure.
M M M	All metal pipes, earth terminals of protective conductors class I and class II equipment, and accessible exposed conductive parts of the building structure.	Metal pipes themselves can be used as bonding conductors if joints are metal to metal and electrically continuous.
M M P	All metal pipes, earth terminals of protective conductors of class I and class II equipment, and accessible exposed conductive parts of the building structure.	Metal central heating radiator does not require bonding.

P = Plastic M = Metal

NB: All Waste Pipes are plastic.

1. Supplementary bonding is carried out to the earth terminal protective conductors of class I and class II equipment within the bathroom. A supplementary bond is not run back to the main earth.
2. Metal window frames are not required to be supplementary bonded unless they are electrically connected to the metallic structure of the bonding.
3. Metal baths supplied by metal pipes do not require supplementary bonding if all the pipes are bonded and there is no other connection of the bath to earth.
4. All bonding connections must be accessible and labelled 'Safety Electrical Connection – Do Not Remove'

## Connecting to other plumbing fixtures

As shown in the Trade Price List, the Speedfit range of fittings includes valves, taps, adaptors and connectors for the plumbing of all typical domestic appliances and fittings.

## Discharge pipes

Speedfit pipe should not be used to provide the discharge from unvented cylinders, unvented water heaters and sealed systems via the temperature relief and pressure relief valves.

## Water heaters

Speedfit recommend that mains supply pipework to unvented water heaters (up to 15ltr capacity), be run in metal pipes.

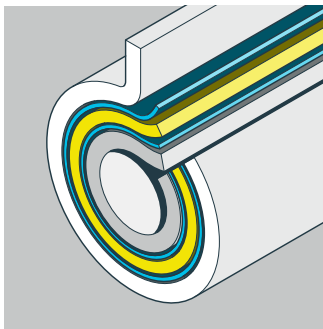
Adequate provision must also be made regarding thermal expansion of water from a water heater. The use of an expansion relief valve and/or an expansion vessel must be used where water expansion is not possible back into the mains supply.

Ensure water temperatures do not exceed those recommended for Speedfit.

# Installing pipework

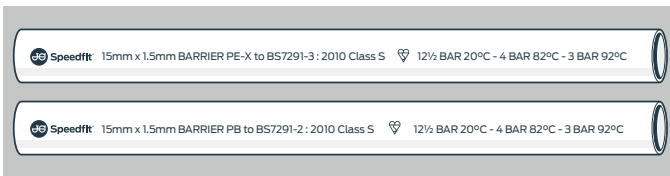
## Speedfit Barrier Pipe

Speedfit Barrier Pipe is manufactured to BS 7291 Parts 1, 2 and 3 Class S and is Kitemarked.



It is made up of 5 layers, the centre of which is a blue coloured oxygen barrier which prevents the ingress of air into the system, thereby reducing the effect of corrosion on metal components. Because of its low thermal conductivity when carrying hot water, Speedfit pipe is cooler and therefore safer to touch. Relatively

low heat loss through radiation means that a system retains its heat longer and delivers hot water more quickly and with less wastage than a metal system.



The pipe is available in coils and straight lengths. Pipe markings are spaced to aid the making of a good connection when using a Superseal Pipe Insert.

## Pipework sizing

For general guidance on pipework sizing, please refer to BS EN 806 and complementary guidance document BS 8558, or the Institute of Plumbing Engineering Services Design Guide. Speedfit Fittings are suitable for pipes within  $\pm 0.1\text{mm}$  of nominal size. They can be used with copper pipe to BS EN 1057 or Speedfit plastic pipe.

The Product Range List shows the fittings available for reducing pipe diameters within the system.

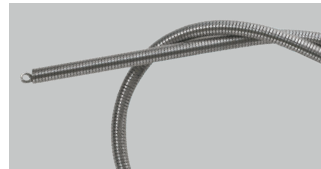
Speedfit pipe is available in straight lengths and coils.

## Pipe bending

Gentle bends can be made with pipe clips on either side of the curve, positioned to maintain the bend radius.



Tighter bends can be achieved by using the cold forming bends shown on.



Internal Bending Springs are available in 10mm to 22mm sizes.

It is also possible to bend Speedfit pipe using a standard pipe bender. The pipe should not be heated with a blowlamp or hot air gun.

Minimum bend radii for Speedfit pipe (BPEX and BPB) are as follows:

### Speedfit min radius

	Pipe diameter			
	10mm	15mm	22mm	28mm
<b>With cold forming bends</b>	30mm	75mm	110mm	–
<b>With clips</b>	100mm	175mm	225mm	300mm

### BPB min radius

	Pipe diameter			
	10mm	15mm	22mm	28mm
<b>With cold forming bends</b>	30mm	75mm	110mm	–
<b>With clips</b>	80mm	120mm	176mm	–

For bends of radii smaller than those shown, standard elbow fittings are recommended.

## Pipe support and clipping

There are two types of pipe clip in the Speedfit range.



Firstly, a nail clip is used for fixing to timber when running concealed pipe work i.e. underfloor or in a roof space. This clip takes less time to fit and is compact which allows pipework to be fixed close together when space is at a premium.



The second type uses a screw and therefore takes a little longer to fix. When pipes are required to cross over, it is possible to add a spacer to the clip. This will give room between the pipe and the wall to allow the pipes to cross over. If pipework needs to be insulated, using the spacer will give room for the lagging to be applied.

**Pipe clips should not be fitted any closer than 60mm from the end of the fitting to allow for expansion. Pipes should always be adequately supported to prevent undue stress or side load on the fittings.**

## Recommended clip spacing

For surface mounted pipes.

Pipe diameter	Clip spacing	
	Horizontal run	Vertical run
10-15mm	300mm	500mm
22mm	500mm	800mm
28mm	800mm	1,000mm

## Pipe sizing

For general guidance on pipework sizing, please refer to BS EN 806 and complimentary guidance form BS 8558, and BS EN 12828 or the Institute of Plumbing Engineering Services Design Guide. Speedfit Fittings are suitable for connection to pipe sizes within ffl 0.1mm of nominal size.

The maximum heat carrying capacity and flow of Speedfit pipe, based on 1.2m/s velocity and an 11°C temperature drop is shown in the table below.

Pipe size	Max capacity kW	Max flow litres/sec	Headloss m/m pipe
10mm	1.948	0.042	0.283
15mm	5.941	0.129	0.139
22mm	13.604	0.295	0.084
28mm	21.991	0.478	0.062

## Pipework insulation

The insulation requirements for Speedfit pipe are the same as those for copper and should comply with BS EN 806 and complimentary guidance form BS 8558, and BS5422.

## Concealed pipework

The flexibility of Speedfit pipe gives it the ability to be threaded through concealed or inaccessible spaces without disruption to surrounding structures, making major savings in installation time.

Pipework can be 'cabled' through drilled holes in joists and rafters. Therefore, pipework can be installed after floorboards have been laid, working below the floor before the ceiling is installed.

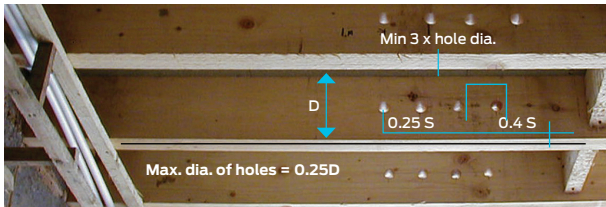
This makes site work far safer as the installer does not have to balance on open joists with the risk of dropping tools or equipment on other people below.

This will also eliminate the risk of damage by floorboard nails. There is no need for dry runs since pipe can be cut and connections made in-situ.

Rigid pipe, such as copper, can only be fed under floor in short lengths. However, Speedfit pipe, being flexible, can run from one fitting to another without having to install a connector in between.

Speedfit needs no jointing materials, eliminating the risk of fire from the use of a blowlamp, solder and flux. Installers are also not exposed to the health issues related to breathing in toxic flux fumes.

## Traditional joists



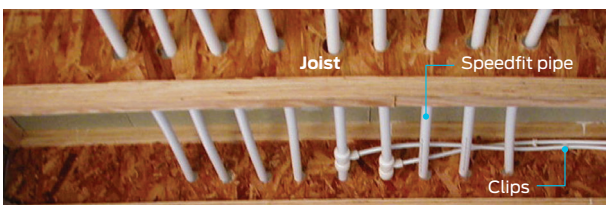
Instructions on the drilling of joists is given in the Building Regulations Approved Document A, and summarised as follows:

1. Holes should be no greater than 0.25 of the depth of the joist
2. Holes should be drilled at the neutral axis
3. Holes should not be less than 3 diameters (centre to centre) apart
4. Holes should be located between 0.25 and 0.4 times the span from the support

## Timber 'I Beam' joists

Several types of joists are available and Speedfit recommends that specific manufacturers details are consulted. However, the following can be used for general guidance:

- Holes may be located vertically anywhere in the web, but leave 3mm web at the top and/or bottom of hole. Do not cut into joist flanges when cutting the web.
- If more than one hole is to be cut in the web, the distance between the edges of the holes must be at least 2x diameter of the largest hole.
- Generally joists are manufactured with 38mm perforated knockouts in the web at approximately 300mm centres along the length of the joist.



## Cross web joists



Unlike 'I beam' joists, pipe can be cabled anywhere within the open Web as no drilling is required. However, the top and bottom flanges must not

be notched. Avoid damaging the outside diameter of the pipe as you cable through the metal cross web members.

## Timber framed construction

Speedfit is well suited for timber frame construction. Ensure that the structural integrity is not compromised when installing the pipework. If the pipe passes through an external wall, care must be taken not to damage the vapour barrier and should be installed on the inside of the thermal insulation layer.

If this is not possible, the use of conduit should be specified at the design stage.

## Steel framed construction

Speedfit is well suited for steel frame construction and care should be taken when installing the pipework. All runs should be installed through preformed hole in the structure and protected by a rubber or plastic grommet.

Where clipping of pipework is restricted, cable ties may be used to secure the pipe. As with all installations, make sure that any pipework passing through walls and floors does not affect the fire resistant properties of the structure.

## Dry lined walls

Speedfit pipework can be easily cabled through studwork and within wall systems as well as behind 'dot and dab' plasterboard installations. Speedfit 10mm Barrier Pipe is most commonly used to feed radiators. If incorporating fittings in this way, collet covers or collet clips must be used with the Standard Range of Fittings.

## Wet plaster

To prevent surface damage to the plaster caused by expansion and contraction of Speedfit Pipes, it is important to ensure that all Speedfit Pipework is channelled into the wall and protected with appropriate sleeving. Alternatively, the pipework can be surface mounted and boxed in if required for aesthetic appearance.

## Laying of pipe in concrete and masonry

Speedfit pipe and fittings can be laid in concrete and masonry providing they are installed in conduit pipe with access boxes for the fittings. As stated in Water Regulation Schedule 2.7 and BS 8000: Part 15, fittings and pipe should be removable for possible replacement. Insulation is also recommended to protect against heat loss and the effects of frost. Speedfit Conduit Pipe is in



either 15mm or 22mm in coil lengths of 25m or 50m. The flexible convoluted pipe has an outside diameter of 24mm and 30mm.

## Exposed pipework

On long exposed runs of pipework, the expansion of Speedfit pipe when warm (1% on length between 20 to 82°C) can cause it to sag between clip fixings. When this is undesirable, pipework can be boxed in.

Speedfit pipe and fittings are stabilised to withstand limited exposure to ultra-violet radiation in sunlight but are not designed for permanent direct exposure. Under such conditions painting or lagging is required. Pipe and fittings should also be lagged to prevent frost damage.

## Chemical effects

Only water or oil based paints should be used. Do not allow Speedfit fittings to come into contact with jointing compounds, cellulose based paints, paint thinners or strippers, solder flux, acid based descalents or aggressive cleaning products including those below pH4, high in hypochlorite (e.g. bleach) or containing hydrogen peroxide. (See the **disinfection of hot and cold water systems** section of the installation advice for specifically permitted disinfection procedures).

If there is a risk of any chemical treatments coming into contact with Speedfit, please contact the Technical Advisory Service first to check compatibility.

## Fluxes and Speedfit

Speedfit does not recommend that fluxes of any type come into contact with our pipe and fittings. However, if fluxes are to be used in an environment where Speedfit is installed then we recommend installers use non-acidic and zinc chloride free fluxes such as Fernox Flux.

## Acoustic

Properly installed, Speedfit pipes are virtually silent in operation and do not resonate; they absorb the acoustic vibrations and pressure waves created by cavitations, water hammer, float operated valve oscillation and other hydraulic effects. The inherent flexibility of Speedfit pipe effectively eliminates these troublesome problems, including those that occur when, due to thermal expansion, metal pipes rub against structural members and where long, straight runs of rigid pipe amplify water borne noise.

## Protection against rodents

When used in locations vulnerable to rodent attack, all plastic pipes and fittings should be adequately protected within sealed ducts. Speedfit products along with other materials such as electrical cables may be damaged if rodents are present. If vermin infestation is suspected then a rodent exterminator should take appropriate action to prevent structural damage or disease.

## Biological

No taste, colour, odour or toxicity is imparted to water by Speedfit components, nor do they promote microbiological growth. In accordance with BS7291 Part 1 requirements, the opacity of both pipes and fittings allows insufficient light to pass for the growth of algae. Tests within the Water Regulations Advisory Scheme, have approved Speedfit pipe and fittings to BS 6920 for water quality.

## System testing

On completion of the plumbing and heating system it is essential that system checking and a hydraulic wet test takes place. Connections to boilers, radiators and sanitary ware should first be capped or plugged. Testing should be carried out at 2 bar for 10 minutes followed by 10 bar for 10 minutes. This testing combined with other relevant checks, should reveal most system problems. Any components within the system not designed to take these pressures should be disconnected.



Before carrying out a pressure test ensure all Speedfit pipe and fittings are installed correctly. Speedfit Barrier Pipe is printed with insertion marks to help ensure full insertion has been achieved.

Remember pressure testing is NOT a substitute for making sure fittings are clean and free of any grit, dirt or swarf and the pipe is correctly inserted (see Making a Good Connection).

## System commissioning and flushing

With existing systems, flushing prior to the use of Speedfit is essential to remove any harmful contamination or chemical residues from elsewhere in the system.

For the installation of central heating systems flushing procedures must be in line with BS7593 code of practice for treatment of water in domestic hot water heating systems. Flux residues used in the soldering of capillary fittings are very corrosive. Dirt and grit, which can enter the system when Speedfit pipe is being pushed through underfloor or across a roof space, must be removed.

During the commissioning of a heating system, all air must be removed from the system before the boiler is allowed to fire. This will ensure pockets of air do not cause localized overheating within the system as this could have a detrimental affect on the pipework and boiler.

For further advice on chemical flushing agents and inhibitor treatments, the following manufacturers should be contacted:

Fernox Manufacturing Ltd: 0330 100 7750  
Sentinel BetzDearborn Ltd: 0151 424 5351  
Adey Innovations LLP: 01242 546717

## Disinfection of hot and cold water systems

Speedfit can be disinfected with chlorine (sodium hypochlorite) after installation. Domestic systems are disinfected with a solution of chlorine with a concentration of 50ppm (mg/l) for one hour. The concentration should not be less than 30ppm at all draw off points after this time.

Other disinfection methods and chemicals (e.g. ozone and hydrogen peroxide) are now in common use. Only those specifically recommended as suitable for contact with plastic plumbing systems and, where necessary, employing specialist contractors may be used with Speedfit.

Disinfection solutions must only come into contact with the internal (wet) surfaces of the system. If any normally dry surfaces of a Speedfit fitting come into contact with disinfection solution the whole fitting must be replaced immediately. The disinfection solution must be immediately flushed out at all draw off points with fresh, wholesome water at the end of the disinfection period.

**The solution must not be left in the system.**

## Common problems and identification

Problem	Identification
<b>Burst or melted pipe</b> Pipe will be distorted showing either a 'Parrot beak' look or a long opening with the edges of the pipe melted in a wave shape.	A Parrot Beak burst will happen when the water expands within the pipework when it freezes. If the pipe has a melted appearance or gapes wide open this could be due to external heat from a blow lamp or similar. It is more likely that water has risen to a high temperature over 128c due to being pressurised. Melting the pipework and exploding into steam at it is then exposed to atmosphere.
<b>A fitting or part of a fitting dissolved</b>	The fitting will have failed because of a chemical attack. The most common attack is from acid based solder flux running down into the fitting during soldering of a nearby copper fitting or flux coming into contact with the fitting in some other way.
<b>Weep from fitting</b>	The pipe has not been fully inserted up to the pipe stop or one or both of the O-Rings have been damaged by burrs or sharp edges on the end of pipe. See 'What not to do' on page 7.
<b>The fitting has blown off the pipe</b>	If this happens on first fix, the most likely reason is that the pipe has not been fully inserted into the fitting, up to the pipe stop, and the system has not been pressure tested. If the collet (gripping device) is missing everything will blow out. If the collet is there and the pipe support is still inside the connector but the pipe has still blown out, this means that full insertion had not been accomplished.

## Technical advisory service

Speedfit Technical Advisory Service is available to assist on all aspects of using the Speedfit system. The service is available between 8.00am and 5.00pm, Monday to Friday on Telephone No. 01895 425333 and Fax No. 01895 425350. Products within this Product Guide are designed for use within UK plumbing and heating installations or in other countries where similar installation requirements apply. For information on products suitable for use in other countries please consult our Technical Advisory Service.

We take pride in the quality of our products and all complaints are investigated thoroughly. If you have a problem with a Speedfit product please return both fitting and pipe to us for investigation. We will need at least 50mm of pipe to ensure an accurate analysis. If there is a suspicion that the pipe is faulty, please provide marking details from the pipe.

## Metal foil tape

Speedfit aluminium Foil Tape can be used to fulfil the NHBC requirements for the identification of location of plastic pipes in or behind a wall surface by a metal detector. It features a bright aluminium finish, rubber/resin high-tack adhesive and quality siliconised backing paper to allow the easy handling of short, cut lengths.

**DO NOT** stick the tape to the Speedfit pipe or fittings or those of any other manufacturer.

# Technical checklists

## Plumbing and heating fittings

Fittings and pipe should be kept clean and undamaged before use.

**Sizes:** 10mm to 28mm diameter.

**Pipes:** Speedfit fittings can be used with:

- Copper pipe to BS EN 1057
- Speedfit Barrier Pipe to BS7291

Speedfit fittings cannot be used on stainless steel pipe.

**Standards:** Speedfit products are designed and manufactured under a fully integrated system assessed by B.S.I. to BS EN ISO9001 and are approved by the Water Regulations Advisory Scheme. Speedfit 'PEM', 'PSE' and 'SFM' Fittings and Speedfit Barrier Pipe are Kitemarked to BS7291 Parts 1, 2 and 3 Class S (Licence No. KM39767).

**Applications:**

- Mains fed and indirect cold water systems
- Vented and unvented hot water systems
- Vented and sealed central heating systems

**DO NOT USE FOR Gas, fuel oil or compressed air applications.**

**Working Temperatures and Pressures:**

Application	Usual working temperature °C	Maximum working temperature °C	Maximum working pressure, bar
<b>Coldwater</b> (indirect and direct mains)	20	20	12
<b>Central heating</b>	82	105, short term malfunction at 114	3
<b>Hotwater</b> (including unvented cylinders)	65	95	6

**Burst Pressure (fittings):** With copper or plastic pipe at 20°C: Speedfit fittings used with copper or Speedfit Barrier Pipe will withstand pressures well in excess of normal service conditions.

**High Temperatures:** Can withstand 114°C intermittently for short periods. The Speedfit system should not be used on an uncontrolled heat source.

**Insulation:** Should comply with BS EN 806 and complimentary guidance document BS 8558, and BS5422, as for copper.

**Minimum Bend Radii (BPEX):**

Pipe Diameter	10mm	15mm	22mm	28mm
<b>Min radius with clips</b>	100mm	175mm	225mm	300mm
<b>Min radius with cold forming bend</b>	30mm	75mm	110mm	-

**Minimum Bend Radii (BPB):**

Pipe Diameter	10mm	15mm	22mm	28mm
<b>Min radius with clips</b>	80mm	175mm	225mm	300mm
<b>Min radius with cold forming bend</b>	30mm	75mm	110mm	-

**Clip Spacing (in mm) For Surface Mounted Pipes:**

Pipe diameter	Clip spacing	
	Horizontal run	Vertical run
10 - 15	300	500
22	500	800
28	800	1000

Where pipe is concealed, clipping may only be required where necessary.

**Expansion (PEX pipe):** 1% on length between 20°C and 82°C.

**Flow Rates:** Comparable with metal systems.

**Cleaners, Inhibitors and Descalents:** For advice on the replenishment of additives such as corrosion inhibitors, the following manufacturers should be contacted: Fernox Manufacturing Limited on 0330 100 7750, Sentinel BetzDearborn Limited on 0151 424 5351 or Adey Innovations LLP on 01242 546717.

**Paint and Chemicals:** Use only water or oil based paint. **DO NOT ALLOW CONTACT WITH** jointing compounds, cellulose based paints, paint thinners or strippers, solder flux, acid based descalents or aggressive cleaning products, including those below pH4, high in hypochlorite (e.g. bleach) or containing hydrogen peroxide. (See the DISINFECTION OF HOT AND COLD WATER SYSTEMS section of the Product Guide installation advice for specifically permitted disinfection procedures).

**Solder Flux:** No fluxes of any types should come into contact with JG Speedfit Pipe and Fittings. If fluxes are to be used in an environment where Speedfit is installed, then (1) extreme care should be taken to ensure that no such contact takes place and (2) JG recommend installers only use fluxes tested and approved in writing in advance by JG. At the date of this publication, the only such approved flux is Fernox Flux.

**Chlorine:** Speedfit is not suitable for use in systems where the water contains high levels of chlorine. e.g. swimming pools, fountains etc.

**Exposure to Sunlight:** Speedfit products, when used indoors, are not affected by sunlight. When used outdoors protect from ultra violet light by lagging or painting.

**Pipe Clips:** Pipe clips should not be fitted any closer than 60mm from the end of the fitting. Pipe should be adequately supported by pipe clips to prevent undue stress (side load) on fittings.

**Pipe Inserts:** Must be used on all installations when using plastic pipe and should be fully inserted. Only use a Speedfit Insert with Speedfit Pipe.

**Metal Joists:** When 'cabling' plastic pipe through metal joists ensure rubber grommets are in place to prevent damage to pipe. Use of collet covers or collet clips on fittings recommended.

**Connection to Boilers:** A minimum 1 metre run of copper pipe must be installed between the boiler and the Speedfit system, as per BS5955: Part 8.

**Connection to Copper Pipe:** 450mm is the minimum distance to make a solder connection on copper pipe inserted into a Speedfit Fitting. Ensure that any residual flux and solder does not come into contact with the fitting.

**Concrete and Masonry:** Speedfit pipe and fittings can be laid in concrete and masonry providing they are installed in conduit pipe with access boxes for the fittings. This is to enable the pipe to expand and to provide accessibility for both pipe and fitting. As stated in Water Regulation Schedule 2.7 and BS8000: Part 15, fittings and pipe should be removable for possible replacement. Insulation is also recommended to protect against heat loss and the effects of frost.

**Electrical Continuity:** If Speedfit is used in an existing metal system which may have been used for earthing, electrical continuity should be reinstated.

**Valves and Taps:** Plastic 15mm and 22mm valves and taps available from JG Speedfit Ltd are not suitable for central heating installations.

**1/4 Turn Valves:** These valves have been designed to allow temporary servicing of downstream equipment and must only be used in the fully open or fully closed position.

**Do Not use these Valves:**

- In a partially open position to control flow.
- To provide a permanent termination.
- Without tubing assembled or plugged (or threaded connections sealed).
- As a tap or "faucet".

**Collet Covers:** Collet covers provide added security against pipe disconnection, e.g. the fittings coming into contact with rigid surfaces and behind dry-lining walls. They are offered in white as standard and in red or blue to provide colour coding of pipe.

**Collet Clips:** White and Grey collet clips are used with standard fittings to prevent accidental pipe disconnection. Red or blue clips provide colour coding of pipe. Red and blue clips should not be used to prevent accidental release of pipe.

**Continuously Operated Re-Circulating Systems (Secondary Hot Water Circulation/Ring Main Installations):** A continuously operated re-circulating system is a water-replenished circulating system which is maintained at a constant high temperature to provide a constant source of hot water. Continuously operated re-circulating systems are used to distribute constant hot water to draw off points that may be distant from the source or hot water storage vessel. Continuously operated re-circulating systems are very different from conventional hot water supply and central heating systems found in domestic properties, for which our products have been tested to, under either BS7291 2010 Class S or WRAS approval standards, and for this reason Speedfit products must not be used on any continuously operated re-circulating systems as they are not approved under the current version of these standards.

**System Testing:** To ensure the pipework and fittings have been installed correctly, whether it be on a new or extended system, it is essential that the system is checked and hydraulically wet tested. Testing should be at 2 bar for 10 minutes and 10 bar for 10 minutes. This testing, combined with other relevant checks, should reveal installation problems and is regarded as good plumbing practice. Speedfit Stop Ends and Plugs are particularly useful during this operation, enabling all outlets and any fittings to be easily plugged. However, system testing should not be regarded as a substitute for correct installation. See also "Making a Good Connection".

**System Flushing:** As is usual practice for any plumbing installation, flushing of the system prior to the use of Speedfit is recommended to remove any contaminants/chemical residue from elsewhere in the system.

British Gas Service has accepted the John Guest Speedfit fittings as being suitable for open vented and sealed central heating systems and as eligible for acceptance onto its service contracts.

Products within this Price List are designed for use within UK plumbing and heating installations or in other countries where similar installation requirements apply. For information on products suitable for use in other countries please consult our Technical Advisory Service.

**Vermin:** Speedfit products should not be used in vermin infested areas.

**Maximum Torque Figures (BSP & BSPT):** Plastic threads are not generally as strong as brass threads. Customers and end users should be aware of this when choosing products for their applications. Overtightening of plastic threads will cause undue stress and eventual cracking and leakage. The maximum torque figures for BSP and BSPT threads used on Speedfit plumbing products in mating threads conforming to relevant BS or International thread standards are shown below.

Thread	Size	Maximum torque
Plastic	1/2"	3.0 Nm
	3/4"	4.0 Nm
Brass	1/2"	4.0 Nm
	3/4"	5.0 Nm

It is recommended that all installations are checked prior to use to determine that a seal has been made.

**Side Loads:** John Guest products are not designed to be used whilst under side load as this may adversely affect their ability to function long-term. always ensure tubes have good alignment with the fitting. They must also not be subjected to any form of impact or other damage, such as being hit or dropped, even accidentally. If fittings have been damaged or suffered an impact, they should be replaced immediately. John Guest warranty does not cover loss caused by any form of damage.

## Fittings for cold water services

**Applications:** Speedfit Fittings for Cold Water Services are designed to connect MDPE pipes (MRS-PE80) used above or below ground, to convey potable water from distribution mains to individual properties.

**Pipes:** The Fittings can be used with:-

- Blue pipe to BS EN 12201-2, 20mm PN16, 25mm and 32mm PN12.5.

**Adaptors:** Are available for:

- Copper to BS EN1057 and PEX or PB to BS7291.
- Screwed pipe.
- LDPE to BS1972 Class C and Class D in 1/2" and 3/4" sizes.

**Fittings for PEX and Copper Pipe:** Must not be buried into ground, soil, concrete or other substrates.

**Working Temperatures and Pressures:** Maximum working pressure 16 Bar @ 20°C.

**Standards:** The Fittings are approved by the Water Regulations Advisory Scheme.

**Performance:** The fittings are manufactured from tough plastic material well able to meet the stringent requirements of the water industry. They have been approved by the WRAS and, as such, have passed the 'pull out test' where a force shown below is applied to a connection between MDPE pipes and a fitting for 5 minutes without the connection failing.

	Size		
Test force	20mm	25mm	32mm
Newtons	1900	2500	4100
Lbs	427	562	921

### DO NOT USE FOR Gas, Fuel Oil or Compressed Air Applications or Hot Water

**Chemical Effects:** For below ground applications the fittings require no additional preparations - coating etc. When used above ground, avoid contact with aggressive chemical compounds. Protect from frost where necessary. In the United Kingdom, potable water does not contain high levels of chemicals (eg chlorine etc) that would adversely affect Speedfit Underground Fittings.

**Paint and Chemicals:** Use only water or oil based paint. DO NOT ALLOW CONTACT WITH jointing compounds, cellulose based paints, paint thinners or strippers, solder flux, acid based descalents or aggressive cleaning products, including those below pH4, high in hypochlorite (e.g. bleach) or containing hydrogen peroxide. (See the DISINFECTION OF HOT AND COLD WATER SYSTEMS section of the Product Guide installation advice for specifically permitted disinfection procedures).

**Exposure to Sunlight:** Permanent exposure to direct sunlight will necessitate lagging the fittings.

**Pipe Inserts:** Pipe inserts must be used and fully inserted on all connections to MDPE, LDPE, PEX or PB pipe.

**System Testing:** Pressure test to 1.5 times working pressure for 10 minutes before connecting to the mains supply. It is recommended that all pipe and fitting installations are pressure tested after installation before handing over to the final user

**Maximum Torque Figures:** The maximum torque figures for BSP and BSPT threads used on Speedfit products are as follows:-

Size	Maximum torque
1/2	3.0 Nm
3/4	4.0 Nm

It is recommended that all installations are checked prior to use to determine that a seal has been made.

The maximum torque figures quoted for use with Speedfit fittings are dependent on the mating thread conforming to the relevant British International thread standards.





## Technical support

At Reliance Worldwide Corporation (UK) Ltd we are extremely proud of our heritage and reputation for providing excellent products and customer service levels.

Our highly trained Customer Service Team and Technical Support Team is available and keen to help with product advice, technical enquiries and installation issues; and our Sales Managers are available throughout the UK to discuss product and installation specifications.

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In the interests of continuous product improvement RWC reserve the right to alter specifications as necessary. E&OE. Issue July 2019

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