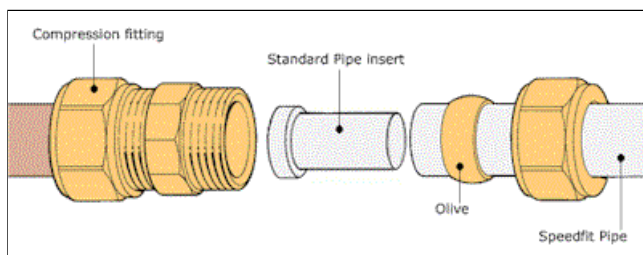


SYSTEM CONNECTIONS

Connection to compression fitting

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. Copper olives are preferable to brass olives.

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



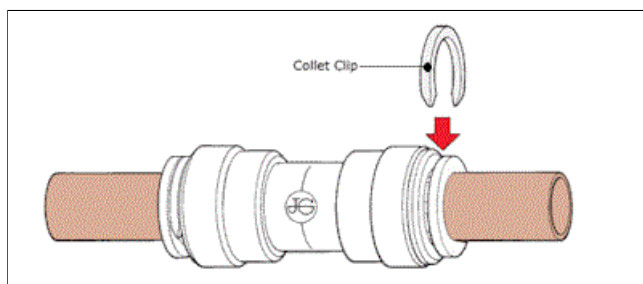
Connection to imperial pipe and fittings

The Speedfit range of fittings includes couplers to connect 15mm and 22mm pipe to 1/2" BSP and 3/4" BSP. To connect 1/2" imperial copper pipe to metric 15mm, Speedfit Part No NC471 should be used.

Connection to chrome-plated copper pipe

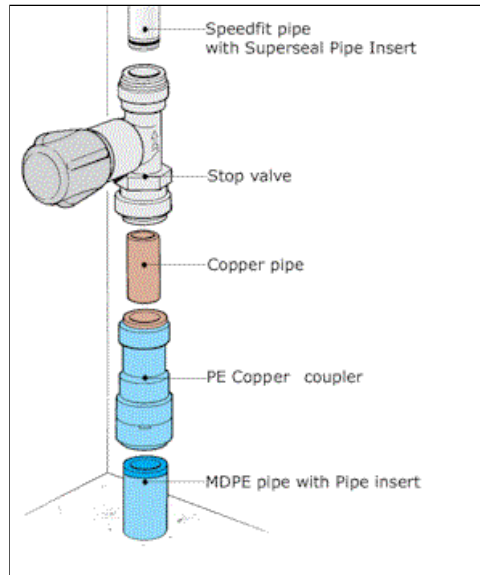
Speedfit fittings can only be connected onto chrome-plated copper pipe if the chrome plating is completely removed to the full depth of the fitting. To ensure maximum grip, the fitting of a collet clip is recommended.

It is not possible to connect Speedfit fittings to stainless steel pipe or hard metal tube.



Connection to mains supply

In modern properties, water enters a building usually in a 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 Valve (Part Nos. 15STV and 22STV) in conjunction with a PE-Copper Coupler from the Speedfit range of Underground Fittings.



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.

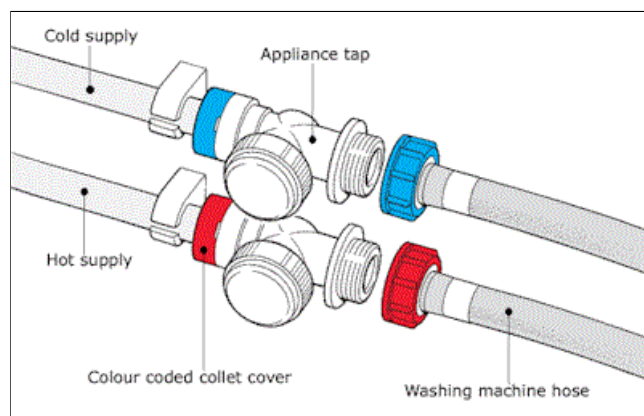
Although most modern boilers have a high limit thermostat, residual heat can be conducted by the heat exchanger. Therefore, Speedfit recommend a minimum of 1 metre from the boiler casing should be run in copper pipe unless otherwise stated in the boiler manufacturer's installation literature.

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.

Connecting to other plumbing fixtures

The Speedfit range of fittings includes valves, taps, adaptors and connectors for the plumbing of all types of domestic appliances and fittings.



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 must not exceed those 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) may be required.

In accordance with current Building Regulations (Part G), discharge pipes from temperature and/or pressure relief valves must be run in metal pipework.

Speedfit connections to combined Cylinder/Boiler units and Thermal Storage Units must be made outside the casing unless otherwise stated in the manufacturer's installation literature.

Drop-Pipe systems

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

With this kind of system it is possible to trap air in the upper floor pipework. 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.

Discharge pipes

Speedfit pipe should not be used to provide the discharge from unvented cylinders, unvented water heaters or 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.

Connection to pumps and valves

Speedfit pipe should be connected to circulating pumps and motorised valves in accordance with the above section headed "Connection to compression fitting". If Speedfit pipe is not mounted on a supporting structure, the pipe must be clipped close to the components' 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 the equipment does not rely solely on the pipework for support.

Connection to copper pipe

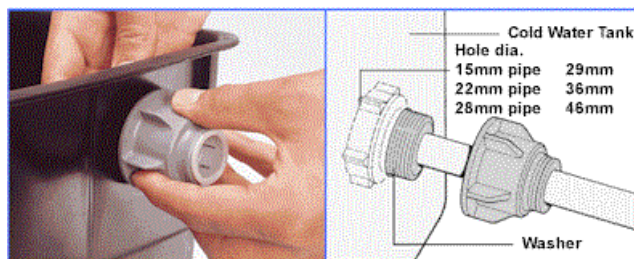
450mm (18 inches) is the minimum distance to make a solder connection on copper pipe inserted into a Speedfit fitting. Ensure that any residual flux solder is not allowed to come in contact with the fitting. That same measurement is the safe distance to use a freezer kit to Speedfit pipe.

Connecting to cold water storage tank

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: Hard 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 Regulations Schedule 2.15, thus preventing contamination of water arising from back siphonage, backflow or cross connection.

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.



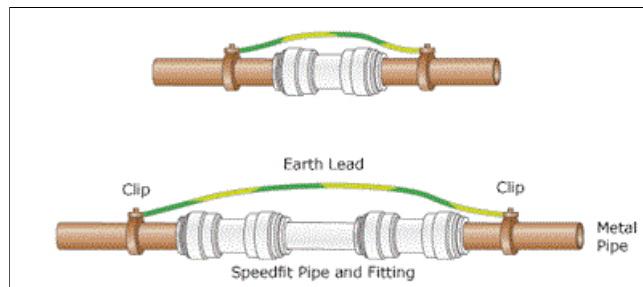
Once the plasterboard is installed the pipes are passed through the Speedfit Radiator Outlet Plate (Part No JG-ROP) to exit plasterboard without creating unsightly holes.

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 class 1 equipment and accessible exposed conductive parts of the building structure.	Bonding of metal taps and 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 class 1 equipment and accessible exposed conductive parts of the building structure.	A bonding is not required to the taps (either hot or cold) or to metal baths unless connected to the metallic building structure.
P	P	M	Central heating pipes, the earth terminals of class 1 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 class 1 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 class 1 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 of equipment within the bathroom with exposed-conductive part. 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 building.
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".

INSTALLING PIPEWORK

Speedfit Barrier Pipe

Speedfit Pex Barrier Pipe is manufactured to BS7291 Parts 1 and 3 Class S and is kitemarked.

It is a cross-linked polyethylene 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 BS6700 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.

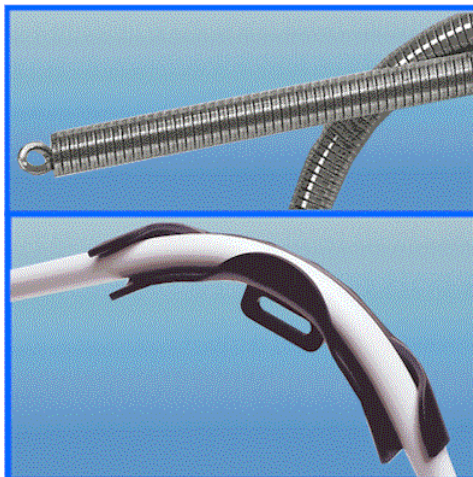
The Product Range List shows the fittings available for reducing pipe diameters within the system.

Speedfit pipe is available in straight lengths and coils.

Pipe Diameter						
Straights	2m	-	-	15mm	22mm	-
	3m	-	-	15mm	22mm	28mm
	6m	-	-	15mm	22mm	28mm
Coils	25m	10mm	-	15mm	22mm	-
	50m	10mm	-	15mm	22mm	-
	100m	10mm	12mm	15mm	-	-

Pipe Bending

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



Internal Bending Springs are available in sizes from 10mm to 22mm. Refer to our Part Numbers beginning 'JG-BS'.

Tighter bends can be achieved by using the Cold Forming Bends shown among the products on this site.

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

Minimum bend radii for Speedfit pipes are as follows:

Min Radius	Pipe Diameter			
	10mm	15mm	22mm	28mm
with Cold Forming Bends	30mm	75mm	110mm	-
with Clips	100mm	175mm	225mm	300mm

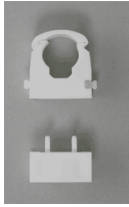
For bends of radii smaller than those shown, standard elbow fittings are recommended.

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 pipework (i.e. under floor 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 in ceilings and roof voids should be clipped every metre.

Pipe sizing

For general guidance on pipework sizing, please refer to BS6700 and BS5449 or the Institute of Plumbing Engineering Services Design Guide. Speedfit fittings are suitable for connection to pipe sizes within $\pm 0.1\text{mm}$ 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	0.319
22mm	13.604	0.295	0.084
28mm	21.991	0.478	0.062

Pipework Insulation

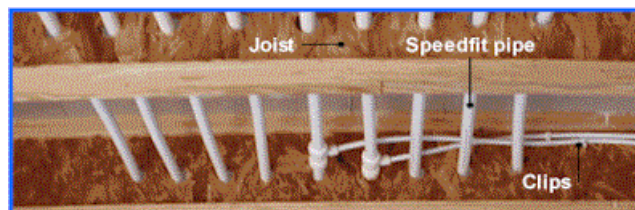
The insulation requirements for Speedfit pipe are the same as those for copper and should comply with BS6700 and BS5422.

Concealed Pipework

The flexibility of Speedfit pipe gives it the ability to be threaded through concealed or inaccessible spaces without disruption to surrounding structure, 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 if access is available from the lower floor before ceilings have been 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,

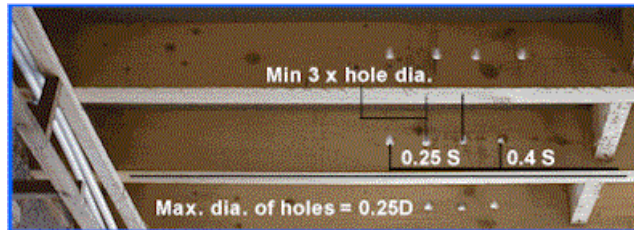
being flexible, can run from one fitting to another without having to install a connector in between.

Speedfit needs no jointing materials, eliminating the risk of fire from the use of blowlamp, solder and flux.

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 twice the 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. The pipe 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 holes in the structure and protected by a rubber or plastic grommet.

Where clipping of pipework is restricted, cable ties must 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 B-PEX Barrier pipe is most commonly used to feed radiators.

If incorporating fittings in this way, collet covers or collet clips must be used within the **Standard** (PKM) 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 reasons.

Laying of pipe in concrete and masonry

Speedfit pipe and fittings can be laid in concrete and masonry provided they are installed in conduit pipe with access boxes for the fittings. 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.



Speedfit Conduit Pipe is supplied in either 15mm or 22mm (internal diameter) sizes. The flexible convoluted pipe has an outside diameter of 24mm and 30mm. Coils of either 25m or 50m length are available.

Exposed pipework

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

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 cellulose based paints, paint thinners or strippers, solder flux or acid based descalents or aggressive household cleaning products. 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

JG 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.

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 that are 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.

Biological

No taste, colour, odour or toxicity is imparted to water by Speedfit components, nor do they promote

biological growth.

In accordance with BS7291 : Part 1 Clause 5.7, 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 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 at 2 bar for 10 minutes and 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 Pex Barrier Pipe is printed with insertion marks to help ensure full insertion has been achieved.

Remember that 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 "[How to Make a 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 Limited on 01799 550811 or Sentinel Betz Dearborn Limited on 0151 420 9595

Technical Advisory Service

The JG Speedfit Technical Advisory Service is available to assist and advise on all aspects of using the Speedfit system. The service is available between 8.00am and 4.30pm, Monday to Friday on Telephone No. 01895 425333 and Fax No. 01895 425319. 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 more 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.

Due to contractual arrangements with the material manufacturers, products within this product guide with a Prefix PKM must not be sold for use in the U.S.A.

Standards and Affiliations



Speedfit fittings and pipe are Kitemarked to BS7291 Parts 1 and 3



Speedit Fittings for Water Services have been accepted by KIWA K12448

