

Sealing gaps around pipes in buildings

Plastic pipes are widely used in the UK for hot and cold water supply for domestic purposes (in homes and other buildings with water and sanitary provisions) and heating installations. In most buildings, pipework will pass through walls and ceilings and there will be a need to seal gaps around the pipework.

The purpose of this guidance is to help readers identify whether sealants are the best technical choice for sealing gaps around plastic pipes and fittings. It covers the points to consider when selecting a suitable sealant including any impacts on plastic pipework.

Is a sealant the right technical solution?

Resistance to Fire
Best Solution: Any opening for services through a fire separating element need to be sealed, including pipework. The means of achieving this are described in the Approved Document B1 and B2 to the Building Regulations and Scottish Building Standards.
Information: Intumescent mastics / sealants are not a preferred solution for sealing openings around services.
Acoustic Performance
Best Solution: Avoid contact between the pipe and the building structure i.e. floor / wall / ceiling by installing an insulation layer (typically 5mm PE foam insulator) in the penetration hole before 'making good' the hole with, for example, a general-purpose sealant.
Information: The BPF Pipes Group guide 'Managing sound transmission inside buildings' covers on installing pipes to minimise noise (https://www.bfpipesgroup.com/technical-information/technical-guidance/).
General building / general purpose
Best Solution: Minimise the size of the gap and fill any spaces that are too small for other materials such as concrete, timber or mortar with a suitable sealant.
Information: Sealants have a wide range of properties in terms of strength, flexibility, appearance, permanence, solubility, corrosion resistance, etc. Further guidance is provided on the following pages.

How to select a suitable sealant?

Sealants are a readily available and versatile means of closing gaps or imperfections around pipes which protrude through surfaces. Having considered whether use of a sealant is the right solution, it is important to think about what job you want the sealant to do.

For example, in general building applications, the use of seals and brackets designed for use with a piping system and correctly installed may avoid the need for additional sealant.

It is important to be clear what the sealant needs to achieve. The three basic functions are:

- Fill a gap between two or more substrates.
- Form a resilient barrier through which other substances cannot pass.
- Maintain sealing properties for the anticipated lifetime of the service.

The performance required of the sealant will depend upon the results it needs to achieve and the properties evaluated accordingly. For example, Approved Document Part B to the Building Regulations allows the use of intumescent mastics / sealants, but it strongly advises that not all materials will be suitable in every situation.

During selection, it will also be important to consider any impacts of using a particular sealant on for example, pipe materials, other parts of the building and the conveyed water.

What performance properties might typically be required?

- **Bonding:** the level of preparation and adhesion to the substrate (building structure) to effectively close the gap around the pipe.
- **Flexibility:** the need to accommodate expansion and contraction of pipes within the building structure and minimise the effect of vibration of pipework and building structure.
- **Viscosity:** the flow properties of the sealant to allow the sealant to penetrate into the gap and to provide a good surface finish (self-levelling).
- **Appearance:** colour, finish, ongoing maintenance.
- **Hygienic properties:** resistance to biological growth (mould).
- **Durability:** long-term resistance to exposure to moisture, chemicals (including cleaning products), temperature, and UV light in its intended environment.

Note: The environment in which the sealant is used may impact on its lifetime. The lifetime of the sealant should be considered in relation to the lifetime of the installation but also accessibility for replacement or maintenance.

What impacts of using a sealant around pipework might need to be managed?

Performance of the pipe: the composition of sealants is many and varied so it is unlikely that the impact of a specific sealant material on long-term pipe performance will have been assessed. To avoid potential damage to any pipe material or fitting (plastic or metal), it is recommended that sealants do not come in contact with the pipe or fitting surface. Care is required during application to avoid spill or spray from solvents, corrosive chemicals etc.

Water supply: where a sealant is likely to come into direct contact with drinking water, the impact on water quality needs to be considered. Some organic compounds have the potential to permeate plastic pipes and fittings, e.g. sealants with a high solvent content, this might also impact on water quality. The impact of materials and chemical on drinking water is covered by national regulations.

Further guidance:

The BPF Pipes Group has produced a series of guidance documents on plastic piping systems inside buildings. Applications include hot and cold water supply, underfloor heating, district heating, and drainage from buildings. These can be found here: <https://www.bfpipesgroup.com/product-applications/building-services>

For technical enquiries on piping systems, contact information can be found on our website.

The BPF Pipes Group does not approve and is unable to recommend specific sealants for use with plastic pipes. Any declaration by a sealant manufacturer that a product is approved for a particular pipe material should not be considered as approval from the BPF Pipes Group or its members.