

Branch connections for water and gas mains

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Introduction

Branch saddles are used to make live connections to gas or water distribution mains. These might be for new connections (for example in-fill developments or reinforcement of the existing infrastructure); for the introduction of air valve and hydrants; or for live by-pass systems to enable pipe sections to be altered, diverted or abandoned without loss of supply to downstream customers.

Where the distribution main is empty, connections can be formed by cutting out a section of pipe and inserting a tee piece. However, branch saddles can also be installed directly onto the existing pipe to minimise the number of field-made joints.

Branch saddle: Fitting installed on or around a pipe to create a branch connection. It requires an ancillary cutting tool for drilling the hole in the main pipe and incorporates a valve to facilitate under pressure tapping.



Tee piece: Fitting which is T-shaped and connected in-line with the main pipe to create a branch connection.

Under pressure tapping tee: Branch saddle with integral cutter. The cut-out remains in the body of the tapping tee after installation.

Branch saddles

Branch saddles are available with electrofusion or mechanical jointing solutions. When installing a branch saddle on a polyethylene main, the BPF Pipes Group and its members recommend that an electrofusion saddle is always used.

Where the distribution main is operational and remains under pressure, connections are best made by installing a branch saddle and tapping into the main. This approach eliminates the need for squeeze-off or flow-stopping so normal services can be maintained to customers during the operation. The working space required is small so excavation works can be minimised.

Where branch saddles are used, the saddle is first fitted and pressure tested to verify the integrity of the joint to the existing pipe. The equipment and procedures for fusion jointing of polyethylene pipes and fittings are covered by industry documents, e.g. WIS 4-32-08: Issue 4: 2016 for water networks. Once a satisfactory test has been completed, a drilling machine with a cutter suitable for polyethylene pipe is used to make the opening for the fluid flow through the saddle into the branch.

An equal tee piece (where the new connecting pipe is the same dimensions as the existing pipe) may be required for capacity. In this case, a branch saddle may be used to create a live by-pass to maintain services while a short section of pipe is isolated to enable the cut-out and insertion of the tee piece.



Branch saddle installed on
PE pipe with spigot outlet



Branch saddle installed on
PE pipe with flanged outlet



Saddle used for new
connection to existing
infrastructure



Saddle used to introduce
air valve to a close fit PE
liner through iron pipe



Saddle used for live by-
pass during equal tee
installation

These offer a strong joint which is:

- **fully end-load resistant**, guaranteeing that the fitting and pipe always remain joined in response to operating loads (e.g. longitudinal loads from contraction and expansion of the pipe due to thermal cycling or from internal pressure due to end-load restraints elsewhere in the pipeline);
- **welded between the pipe and saddle**, ensuring a homogenous connection with no gap between the pipe and the saddle when subject to externally applied loads (e.g. vertical soil loads or bending during installation);
- **wholly resistant to corrosion**, safeguarding the long-term performance of the connection;
- **designed and tested** to be compatible with the standards for polyethylene pipe (BS EN 12201, BS EN 1555, GIS PL2-2, GIS PL2-8), ensuring long-term pressure performance is maintained throughout the product lifetime.

Electrofusion branch saddles are used successfully for new connections (e.g. for building development infill), for retrofitting hydrants and for connecting air valves. Systems are available for all sizes of PE distribution pipe installed in UK networks.

Tee pieces

Tee pieces are available with electrofusion, butt fusion or mechanical jointing solutions. The advantages of an integrated, end-load resistant system are best achieved by fusion welding carried out by skilled operatives. However, there are some circumstances where mechanical joining by flanges is more suitable. The BPF Pipes Group has prepared guidance on the preferred method of joining for a range of applications for both gas and water mains in its publications, and is applicable to tee pieces joints:

- Joining of polyethylene pressure pipes for below ground gas applications
- Joining of polyethylene pressure pipes for below ground water applications

[Visit www.bppfpipesgroup.com to access this guidance.](http://www.bppfpipesgroup.com)

[Visit www.bppfpipesgroup.com to find contact details for BPF Pipes Group members](http://www.bppfpipesgroup.com) who manufacture and supply branch connections for water and gas applications.