

Pre-commissioning of water systems containing copper, copper alloy, stainless steel, and galvanised steel pipework and fittings.

Water systems containing tube and fittings in copper, copper alloy, stainless steel, and galvanised steel should have a regime of pre-commissioning that does not have any detrimental effect on the longevity of the system. Prior to this commissioning, the system should have been pressure tested.

The chemicals used in the pre-commissioning, if incorrectly administered can have a serious effect on the systems' life, therefore the choice of chemicals is dependent on the particular site conditions and the materials used and the method(s) of construction.

Conex Banninger do not recommend specific commercial products, but issue guidelines on a selection of chemicals available that are, if used correctly be suitable for the materials listed above. In all cases these chemicals must be stored, handled, and ultimately disposed of (including flushing water) in a safe manner taking into consideration current regulations such as COSHH, and the Health and Safety at Work Act in their current forms. The selection of chemical(s) may also be influenced by approval from the local water undertaking before chemicals are flushed to drain.

Temporary mains supply(s) should be cleaned and chlorinated in accordance with BS 8558 before being used for system filling and flushing. Alternative sources such as fire hydrants should only be used with prior approval. If the permanent mains supply is used, connection should be made via a verifiable backflow preventer (RPZ valve assembly) in accordance with the Water Supply (Water Fittings) Regulations 1999.

Commercially available chemicals that contain the corrosion and scale inhibitors as constituents listed below will depend on the components of the installed system. Their concentrations will depend on the system volumes, and dilution recommended by the supplier.

Listed below are some common chemical types, and their function(s) found in commercial products.

Component	Inhibitor function
Nitrite	Corrosion inhibitor for ferrous metals.
Nitrate	Corrosion inhibitor for aluminium.
Molybdate	Corrosion inhibitor.
Azoles	Corrosion inhibitor for copper and copper alloys.
Phosphate	Corrosion inhibitor for steel.
Polyphosphate	Scale and corrosion inhibitor. (Reverts to Orthophosphate).
Phosphonates	Scale and corrosion inhibitor.
Silicates	Corrosion inhibitor for steel, copper alloys, and aluminium.
Tannins	Film forming corrosion inhibitor and oxygen scavenger.
Benzoate	Anodic inhibitor.
Triethanolamine, monoethanolamine, alkylcarboxylates and substituted triazines	Organic film formers and corrosion inhibitors.
Phosphono- and phosphino- carboxylic acids	Cathodic inhibitor and scale dispersant.
Diethylhydroxylamine	Oxygen scavenger.
Borate	pH buffer, biocide, and corrosion inhibitor.

Ongoing water treatment should be provided by an accredited third party that specialises in that area of expertise.

**References:**

BSRIA BG 29/2012 Pre-commissioning cleaning of pipework systems.

BSRIA BG 50/2013 Water treatment for closed heating and cooling systems.

BS 7593 Code of practice for treatment of water in domestic hot water central heating systems.

BS 8558 Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages. (Complementary guidance to BS EN 806).

Water Supply (Water Fittings) Regulations 1999.