



Pegler Yorkshire

**XPress**

**Tectite**

### Recommendations for Tectite and XPress Carbon Steel Systems

Great care is taken by Pegler Yorkshire to ensure that its Tectite and Xpress Carbon Steel products reach the end user in good condition.

To this end, the fittings are externally and internally galvanised. The carbon steel tubing is protected from external corrosion by a galvanised coating with an internal heat formed oxide film on sizes up to 54mm to protect the product during transportation and storage, this is produced during the final stages of manufacture.

To ensure the on going integrity of our system products we recommend that in all projects involving carbon steel components, consideration is given in the design and early planning stages as to how to ensure the removal of air and contaminants from within the system.

This should be carried out continuously during filling and how the system will be chemically cleaned, commissioned and maintained thereafter in order to ensure that subsequent service is trouble free and the installation has the desired lifespan.

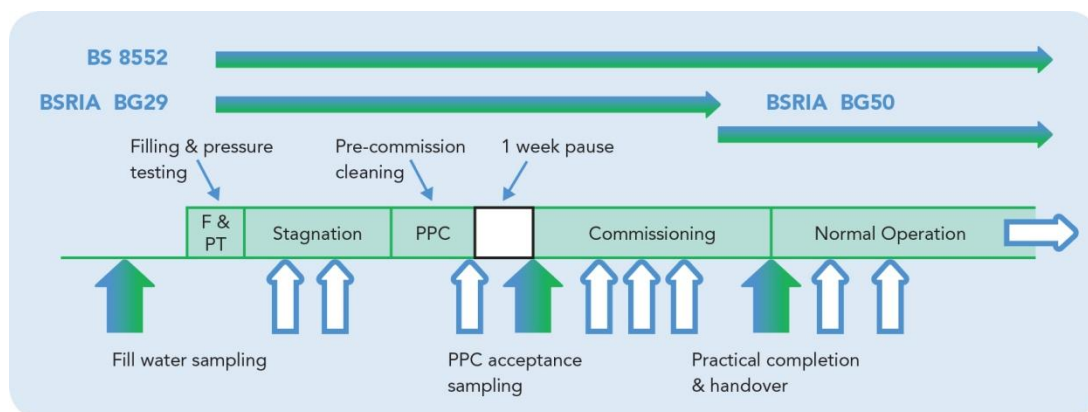
However, once installed, it is not possible for us to control the conditions of service and for this reason it is imperative that the subsequent filling, testing, water treatment , commissioning and maintenance of the system is carried out in accordance with the highest standards of current practice.

BG29:2012 Pre-Commission Cleaning of Pipework Systems

BG50:2013 Water Treatment for Closed Heating and Cooling Systems

BS 8552 Sampling and Monitoring of Water from Building Services Closed Systems

CIBSE and BISRIA current Guidelines for Commissioning Services



We are not specialists in the cleaning and subsequent treatment of water systems but, nevertheless, there are a number of factors that must be considered.

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**Pegler Yorkshire**

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### Stage 1 Testing: Pressure Testing

When pneumatic testing of the pipework system is performed, then the use of a dry air / nitrogen testing media is important.

It is recommended that when using air, the drying performance should conform to 'purity class 3 under the ISO 8573' for particulate contamination, water and oil content.

Guidance should be sought from the relevant compressor manufacturer.

Our technical bulletin "**Pressure Testing of Carbon Steel Systems**" provides more details on this aspect and, in particular, the precautions that need to be taken when using compressed gases. (see *Appendix 1*).

When hydraulic testing is to be carried out we recommend that the use of raw water is subjected to the pipework time for as short a period as possible due to the risk of corrosion, this water should be substituted with chemically treated water once testing is complete, do not leave untreated water in the pipework system – chemically dosed water should be in accordance with the chemical manufacturers' recommendations and in accordance with BSRIA BG29 2012.

### Stage 2: Flushing & Cleaning

The purpose of this stage of the process is to ensure the full removal of contaminants (swarf etc) from the internal pipe work system, therefore flow velocities to achieve such a condition with a capture method should be considered, the use of a chemical clean must be employed.

There are many proprietary cleaning chemicals available for preparing the pipe work for subsequent service. Some of these are acidic, others are neutral but all must be capable of effectively removing any rust and other debris that has formed in the pipe work prior to commissioning, without damaging the various components in the system.

Strong acid cleaners that do not contain inhibitor must be avoided as severe internal wastage may occur, particularly at joints between tube and fitting.

Irrespective of whatever cleaner is chosen, the manufacturer's instructions must be followed exactly, taking particular care to ensure that cleaning agents are completely flushed out of the system before adding any protective inhibitors to the water.

### Stage 3: Inhibitors for Water Treatment

After cleaning the pipe work to a satisfactory standard, it is necessary to add inhibitors to the water in order to prevent corrosion in subsequent service.

It is common to have mixed metals present within a system and consideration should be given to these, however it is the presence of oxygen within the system that is the main corrosive catalyst.

Please refer to BSRIA BG29 2012.

A well maintained system should minimise / eliminate the level of oxygen within the system, particular attention should be given to areas of oxygen ingress such as test points, pump glands and any areas of water loss within the system.

Suitable consideration during the design stage on how to remove oxygen from the system should be given.

Consideration also needs to be given to the ongoing monitoring of inhibitor levels, the importance of this exercise is to protect the product and ensure integrity and lifespan.

The treatment regime will also require a biocide to be added to the water to prevent problems as a result of bacteria building up in the pipe work.



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As with the cleaners, these products should only be handled by skilled personnel and the supplier's instructions and safety procedures must always be followed.

For further information;

As its preferred partner for the use in the water treatment for its pipework systems Pegler Yorkshire recommends;

**PRIMARY WATER GROUP LIMITED**

Contact tel. no. 0161 775 0835

[www.primarywatergroup.com](http://www.primarywatergroup.com)

David Rhodes  
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## Appendix 1



## Pressure Testing of Pipework Systems

It is recommended that completed pipework systems are pressure tested prior to being covered (insulation, or paint), and should be performed prior to commencing the cleaning procedure.

The entire system should be pressure tested in accordance of BSRIA and B&ES

This pressure test can be both pneumatic and hydraulic and is determined by the installed and planned commissioning regime.

If the pipe system is to be left empty after the pressure test, then a pressure test with dry air and/or inert gas should be performed, (microbiological contamination through bacteria and corrosion of carbon steel systems has to be avoided).

The pressure test should consist of two steps;

- Leak test
- Tightness test

The leak test involves inspecting the system for joint integrity (tightness), the tightness test focuses on checking the system for strength.

The tightness test with water is described in the B&ES Guide to Good Practice TR/6, BS EN 806-4, BS6700.

If pre-fabricated pipework or equipment has been hydraulically pressure tested, off site prior to installation, this should be notified to the cleaning/chemical treatment specialist as these may of already developed an internal layer of corrosion, microbiological, biofilm build up etc.

Due to the inherent dangers associated with pneumatic testing using inert gas or dry air a responsible person must be in charge of this operation at all times.

The below must be understood as a recommendation only.

### Basic Procedure

If the system is to be pressure tested (as recommended) then the following procedure applies to each section in turn.

#### 1 Test Preparation

- a. Check that all high points have suitable vents to facilitate removal of air during filling and that these are all closed.
- b. Install suitable drainage facilities at all low points for drainage.
- c. Blank plug or seal any open ends and close all valves at the limits of the test section of the piping
- d. Remove, blank off all terminal units that may be damaged by the test pressure.
- e. Open all valves within the enclosed test section.
- f. Check that the test gauge is working correctly and has been calibrated, and has the correct range.
- g. If the compressed dry air or inert gas is at a higher pressure than is required for the test (maximum 0.5bar pressure) a pressure reducing valve, pressure gauge and pressure relief valve set to open at the test pressure should be fitted to the connecting pipework.
- h. If possible the compressed air supply should be outside the test area
- i. Check that there is a suitable method for draining the system.



It is recommended that systems be tested with a nitrogen rich (90%)/air mixture. If air is to be used it should be clean, dry and free from oil, the drying performance should conform to 'purity class 3 under the ISO 8573' for particulate contamination, water and oil content.

Guidance should be sought from the relevant compressor manufacturer.

Excessive oil carry over in compressed air may be detrimental to the EPDM seals as well as causing bacteriological issues. Pure Nitrogen is also acceptable but consideration should be taken of HSE guidelines or recommendations.

## 2 Pneumatic Pressure Testing

- a. An initial low-pressure test at 0.5 bar is to be carried out, having put the necessary safety measures in place, to enable any leaks to be found.  
Significantly leaking, un-pressed or damaged joints shall be replaced, but those with low leakage rates should be identified for close inspection during the high-pressure test.
- b. This test pressure is to be maintained / pumped for a period of 30 minutes minimum.
- c. The test is passed if the pressure in the system is maintained for one hour and there is no visible leakage throughout the test.
- d. If required, a signature should be obtained on a test certificate.
- e. After testing, safely release the pressure, if necessary ensure that all vents on cylinder tanks and pressure vessels are opened to atmosphere BEFORE draining down and refitting vulnerable items.

These test times may vary according to the pipework system (plastic pipe systems may take longer to achieve stable pressures).

Water Regulation 12 requires 'that the water system shall be capable of withstanding an internal water pressure not less than 1.5 times the maximum pressure to which the installation or relevant part is designed to be subjected to in operation'.

When hydraulic testing is undertaken then the following should be carried out.

The test water should contain anti-corrosion inhibitors / long lasting biocide chemicals with the intention that post testing the system shall be left completely full of the test water (suitable protection against freezing and the onset of biological growth will also have to be considered). Circulation of the system test is strongly recommended.

If leaving the system full of water is not practical then every effort shall be made to fully drain and dry the pipe work by purging with dry air/nitrogen. If the system is to be left not in use for longer than 5 days, we recommend that the system be left charged with an inert gas to reduce the risk of onset corrosion and /or bacterial growth.

Inspection of the internal condition to the pipework is recommended so that the water treatment specialist understands the correct process required when cleaning.



3 Hydraulic Pressure Testing

- a. Start to fill the system and 'walk' the route of the pipework being tested. Visually checking for leaks and listening for the sound of escaping air.
- b. Release air from all the high points systematically through the system to ensure the system is completely filled with water.  
(The full loading of the o rings often resolves small leaks identified during the 0.5 bar test).
- c. Turn the pump on to allow the system water to circulate to help reduce the risk of trapped air, bleed the system if necessary. Turn off the pump set when completed.
- d. Check the system contains the correct amount of inhibitors and biocides.
- e. Using an independent pump set, progressively increase the pressure until the system pressure achieves 1.5 times normal working pressure, (verify that this pressure is within the capability of the system components), record the test pressure.
- f. Leave the system for 30 minutes minimum.
- g. The test is passed if the pressure in the system is maintained for the next one hour and there is no visible leakage throughout the test.
- h. Leaking joints at this stage should be identified and marked for replacement.
- i. The system pressure should then be reduced to 0.5 bar again to confirm that no persistent low-pressure leaks are present

Further information can be found in;

Guides issued by BISRIA, B&ES, CIBSE, WRAS and the Copper Development Association (CDA) Guideline document 'Pressure Testing Piping Systems'.

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Pegler Yorkshire Group Limited



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## Appendix 2





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## Warranty

Our policy of continuously and rigorously testing our products means that we are confident they will give the user years of trouble free service. To demonstrate the total confidence we have in our products and our commitment to customer service, all carbon steel systems (fittings and tubing supplied by PY) carry extensive guarantees against manufacturing defects when installed in accordance with our instructions and applications.

Far more reaching details of these can be found in our Xpress and Tectite data books.

The Warranty period is 10 years from the date of acceptance/commissioning by or handover to the end customer whichever is earlier (this date to be confirmed in writing to Pegler Yorkshire Group Limited).

Notwithstanding any other contractual or statutory warranties, Pegler Yorkshire Group Limited warrants that all products of the XPress Carbon System (of matching press fitting, pipe and pressing tool) and Tectite Carbon Systems are free exclusively from material manufacturing and design defects at the time of handover. Manufacturing defects are defects arising in production. Design defects are defects that arise in designing and developing the press fitting.

The Warranty is limited to products and items of the XPress and Tectite Carbon System that are manufactured or marketed by Pegler Yorkshire Group Limited and identified by an Xpress / Tectite or VSH trademark on the material installed in accordance with the installation, testing, or sales documentation. The warranty is further limited in that the pressing jaws or pressing collar approved by Pegler Yorkshire Group Limited and specified in the sales documentation or Installation Guidelines must be used for pressing. Separate instruction / training from the equipment manufacturer must be sought.

The level of Warranty is limited to supplying replacements for the defective components and the cost of removing the defective components and fitting the supplied replacement components of the XPress or Tectite Carbon System. This Warranty cover shall not exceed £100 per event without compliance with the fundamental requirement of Pegler Yorkshire Group Limited being given the opportunity to appraise the defective components in-situ and the defective components of the XPress / Tectite Carbon System being sent to Pegler Yorkshire Group Limited. Pegler Yorkshire Group Limited will pay freight costs. Warranty claims are subject to a limitation period of one year after the defect becomes known.

More far-reaching statutory and other contractual claims shall remain unaffected by this Warranty Declaration.

David Rhodes  
Group Quality Manager  
Pegler Yorkshire Group Limited