

Installation & General Maintenance of Carbon Steel systems

Carbon steel pipe systems are widely specified and used in both the UK and across Europe. For effective use of carbon systems there are six criteria that should be determined, and guidance outlined below followed.

1 Correctly specified (correct application).

Carbon Steel cannot be used in external applications unless FULLY protected from the atmosphere and any moisture. It must only be a closed system to prevent the constant introduction of oxygen. It cannot be fitted in a damp or chemically aggressive environment without protective measures. If using Carbon Steel in a chilled application, a complete atmosphere proof vapour barrier MUST be used to ensure that water vapour cannot condense on the Carbon Steel system.

2 System Design.

If the installation is large, valves should be placed at appropriate intervals including either sides of plant or equipment. This will ensure that any draining down required would have a minimal effect on the rest of the system. Suitability of various types of insulations to be used on a Carbon Steel system should be sought from the insulation manufacturer.

3 Correct Installation Practices (including testing).

During the installation process, Carbon Steel must be stored in a dry environment. First pressure tests should be with air at appropriate stages of the build. Final testing can then be done using water at full operating pressure (or as specified by the commissioning engineer), prior to any chemical treatments that may be used. Water should only be used for testing once the system is ready to be commissioned. Please also refer to the SANHA "Leak Path and Testing protocol".

4 Commissioning.

Prior to operation, a system needs to be flushed. This is designed to remove any loose particles of swarf or debris, introduced into the system during assembly. In all instances, the flushing and commissioning of the system should be as per the M&E consultant's specification. Guidance on commissioning and flushing can be found in CIBSE AM14:2010.

5 Chemical Cleaning or Chemical Dosing.

It is vital that the manufacturer of any chemicals is consulted for guidance, suitability and compatibility with the system. If there is concern about the possible build-up of scale or acidification of the water, then inhibitors can be used. They help to demineralise the water and buffer its pH value to a neutral value. Acidification can lead to the formation of hydrogen bubbles which can form pockets and lead to a poor circulation of water. If in doubt, SANHA should also be consulted about the compatibility of the proposed chemicals with the materials in the pipe system.

6 Correct Maintenance.

For the life of the installation. The system should ideally be filled and left with as few changes of water as practical in its lifetime and not left empty for more than 48 hrs, (see overleaf). Building managers and owners should be left with suitable information for an O&M type manual.

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Alterations:

To ensure that there is no detrimental effects to the pipe materials during any alterations, please follow the below guidelines.

- Alterations to the system should only be carried out by a competent engineer who holds an up-to-date training certificate from SANHA.
- All manufacturers' installation instructions must be followed, in particular with regards to the de-burring of the tubes and the use of the appropriate depth gauges and press tools.
- Once a carbon steel system has been drained down, the system must not be left empty for longer than 48 hours. Longer periods than this will cause unnecessary damage to the system materials by allowing oxygen into the system.
- If a system MUST be left longer than 48 hours without being re-filled, the air in the system MUST be removed by replacing it with an inert gas such as Nitrogen.
- Areas of the system that do not need to be drained down should be valved off, where possible, to minimise impact on these parts of the system. The water in the unaffected part of the system should remain in the system upon re-commissioning.
- Remedial works should be scheduled to take place in as short a time period as possible.
- If the system is insulated, should the lagging become wet, it must not release any corrosive chemicals. This is possible both with mineral fibre and phenolic based insulations. BBA certification should be sought for this application.
- Ideally, valves should be placed where additions to the system are made to ensure minimal impact on the system should extra alterations be made at a later date.
- Following the works, any re-commissioning or extra dosing should take place as soon as is practical.
- Care should be taken not to introduce un-approved chemicals, or to exceed the original dosing strengths.
- Care should be taken to ensure all air is completely removed following the re-commissioning of the system.

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