WWW.IWTM-UK.COM
T: +44 208 255 2903
E: info@IWTM-UK.com

FILLING TO VDI 2035 - COMMERCIAL SYSTEMS

GUIDE V2 JAN 23

IWTM-UK GUIDES

FILLING TO VDI 2035 STANDARDS WITH COMMERCIAL SYSTEMS

IWTM-UK and VDI 2035 short form simple guide to filling and testing guidance to be read in conjunction with VDI 2035 Part 2

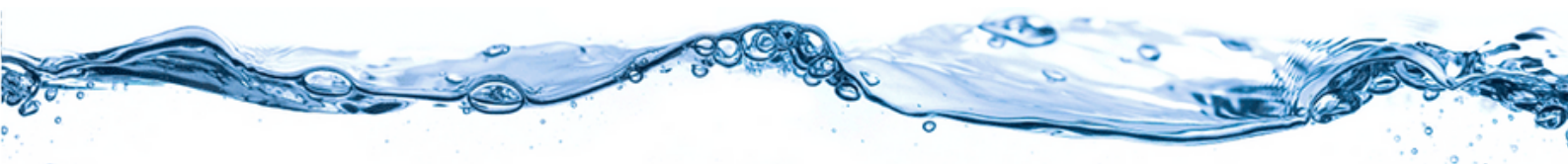
CIBSE CP1 2020 Heat Networks Code of Practise for the UK and CIBSE Heat Network Design Guide 2021 both recognise VDI 2035 as a method of water treatment. VDI 2035 is also recognised within BSRIA BG29/2020 6 Edition Pre-Commissioning and Cleaning Guide. It should be acknowledged that these are guidance documents which leaves the user choice for which one they follow to prevent corrosion damage and provide long term protection of their assets.

IWTM-UK advice is to always follow VDI 2035, using our chemical free technical water approach. We advise against mixing and matching the guidance documents by doing part BSRIA and part VDI 2035 as this can lead to confusion and error. If VDI 2035 is not followed correctly, issues can still arise. For example, VDI 2035 is not just about using any type of demineralised water as there is low grade demineralised water on the market which can have a pH as low as 5 and this can be detrimental to the system.

We have also heard of companies using low grade demineralised water with a low pH and then adding chemical pH buffers to raise the pH. This is against VDI principles as pH buffers are chemicals which VDI 2035 advises to avoid. When using a buffer, the pH levels can drift and not remain stable which results in the pH levels moving away from the VDI 2035 requirements.

IWTM resin which is used with our filling devices is designed for modern heating systems and ensures that the initial fill water is VDI 2035 compliant and is just above the minimum required pH range of 8.2.

Although VDI 2035 does recognise the use of water softeners it also provides warnings about the correct use of softened water and that it can be detrimental when it is not at the right levels. VDI 2035 also states that softened water should not be used with aluminium boilers.



FILLING

Filling the system in accordance with VDI 2035 should be carried out slowly and methodically, filling and venting in this way will make the removal of air from the system easier to achieve than a fast fill and will facilitate a more controlled procedure, especially if the fill needs to be paused because of a problem such as a leak. Our mobile Purotap Expert and Protector ProFill can fill at up to 25 l/min which is 1,500 litres in an hour or 36,000 litres in a 24-hour period which is adequate for many system types.

Filling via the Purotap Expert will ensure the removal of any bacteria in the cold water main and will deliver the demineralised water at zero conductivity. The pH level will be controlled by the IWTM Protector™ / industrial unit if it is being put into use after the initial fill. If the unit is not planned to be turned on for some month's then 'polishing' of the system to lift the pH to 8.2 should be carried out. This procedure is detailed later within this document.

Air removal on the first fill is very important as trapped pockets of atmospheric oxygen create the necessary conditions for corrosion. And an early operation of the system at its maximum operating temperature after filling should be carried out to remove gas cushions and air pockets. Vacuum de-gassers can play an important role in the commissioning of new systems and are recommended by IWTM-UK as they work well alongside our technology.

If the part of the system being filled is not connected to the main energy centre then a mobile vacuum de-gasser unit can be utilised, but this will require circulation.

Draining a system following initial filling should be avoided since residual water cannot be prevented from getting inside the installation components and partially drained systems with a mixture of oxygen can quickly become corrosive. Water line corrosion can appear within pumps, valves, pipework, and components because of partial draining of systems in their early life.

CLEANING OF NEW SYSTEMS AND DYNAMIC FLUSHING

The element of a pre-commissioning work clean can be reduced with good installation practises and site management. For the cleaning procedure, you should follow the method above and then use the demineralised water to rinse the system using a mobile high flow filtration unit, such as our IWTM Protector™ Skid. This will clean and filter the system without dumping any water to drain. As well as, engineering the water at the same time, because the Protector Skid is filled with our anodes.

IWTM Protector Skid, High-flow, dual action rinsing rig

POLISHING THE SYSTEM WATER

“Polishing” is the term we use to finish the system off by rinsing the system water after the final heat testing and commission is completed through a mobile ProFill Mobile by simply passing the water through the Nexion resin. This filters out any final debris, makes sure the pH is where we need it to be and gets the final conductivity close to zero. The Nexion resin controls the pH, removes the salts, minerals, carbon dioxide and delivers zero conductivity for a fully demineralised condition of the water.

IWTM ProFill Mobile, for rinsing , filling and polishing.

This polishing is achieved by connecting the ProFill to the flushing by-pass of the Protector/industrial unit and passing the system water through the resin. On some high-rise buildings where the system pressure at low level in the energy centre is greater than 10 bar you should provide a flushing by-pass connection at the top of the building risers where the system pressure is lower. This is due to the 10-bar operational limitation of the ProFill.

PROTECTOR / INDUSTRIAL UNIT FINAL TESTING

Sampling should be carried out to check the parameters are in line with VDI 2035 for your system records. With a system that has been filled and cleaned to VDI 2035 standards the swing meter on our unit should be showing that it has very little to do and should not be hard right. At completion, flush the unit by opening the base blow down valve ensuring the flushed water runs clear of debris.

Check the flow meter is set to the required flow rate for the particular model in use.

PROFILL FINAL TESTING

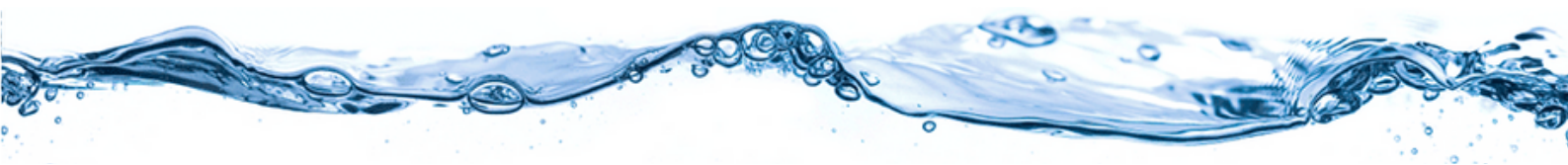
At completion, the meter reading of the ProFill should be noted and the meter volume recorded. The meter if connected to the BMS will send an alarm when the resin life is expiring and is unable to achieve the conductivity level required for the system. The VDI 2035 upper limit for conductivity is 100uS/cm, if the site does not have a full-time engineer you should set the limit at 70 this will allow for time to attend the site and change the resin before you reach 100. If you have full time attendance on site, then setting the alarm at 100 should be sufficient for your needs.

MONITORING AT 10 WEEKS AND UNRECORDED REMEDIAL WARRANTY WORKS

VDI 2035 states that you should visit site after 10 weeks to check all your levels have remained stable.

It should be noted that the Protector / industrial unit is self-regulating. If for example unrecorded remedial works are carried out which may include a partial drown and the building owner/operator is not aware of or advised about. The unit will control the system water after the repair as it will be engineering the system water constantly and the ProFill will ensure that any refill water after the leak repair is fully demineralised. This will return the water to and keep the water in a demineralised condition.

If anyone was to by-pass the ProFill filling device for example, by back filling from a tap via a drain cock, then the anodes will kick into life to deal with the raw mains street water and the swing meter will move over to the right to deal with the untreated make up water and engineer the water to keep it in a fully stable state.



Founded in 1992, IWTM have partnered with Elysator working with chemical free water treatment using electrochemistry for over 30 years and have offices in Norway, UK, Finland, Sweden, Canada, USA and a worldwide presence in the Marine sector.

We have developed models specifically suited to the higher demands of the marine industry operating at higher pressures and higher temperatures.
The marine products are provided worldwide on the world's largest cruise ships working with the leading operators in this sector.

Having secured DNV approval in 2003, we are still the only chemical free water treatment manufacturer to have this certification and approval. DNV is a globally leading quality assurance and risk management company operating in more than 100 countries.

The IWTM Protector™ is our most recently developed product. The Protector range is now available to our land-based customers.

We're greatly encouraged to encounter a genuine industry appetite for culture change with many seeking alternative options for effective, pre-emptive water treatment.

We are looking to help accelerate that positive shift, with all of its associated benefits, seeking to tackle the cause of corrosion rather than the symptoms, and offer ongoing protection thereafter.

By adopting a chemical free approach as part of your environmental policy you are at the forefront of significant and positive change for water treatment in the UK.

IWTM-UK

Sutton Business Centre
Restmor Way
Wallington SM6 7AH
WWW.IWTM-UK.COM
T: +44 208 255 2903
E: info@IWTM-UK.com