



Water Hygiene | Chlorination | Water Treatment | Legionella Control

WATER MAINS DISINFECTION

Chlorination Procedure

A chlorination has recently been carried out on your mains water supply pipe. This is the process of introducing water containing a known amount of free available chlorine into the pipe and allowing it to stand for a known period of time in order to kill potentially harmful micro-organisms such as bacteria.

The normal chlorination procedure involves the introduction of at least 50 ppm of free chlorine and allowing it to stand for at least 1 hour. This is the standard set out by your Water Authority and is the method laid out in the British Standards, BS8558:2011.

The chlorine within the pipe is regularly tested throughout the standing time to ensure that the chlorine levels remain at or above the target strength for the whole period.

Once the chlorine has stood for the allotted time the chlorine is purged from the system. Where it is necessary to neutralise any active chlorine to prevent environmental damage this is done through the use of sodium thiosulphate crystals. These react with the chlorine and render it safe.

Chlorine measurements are once more taken from the system to ensure that all chlorine has been removed and that levels are identical to those present in the mains supply (chlorine is added in small amounts to the water at the treatment works).

Once chlorine levels are normal the system is sampled for microbiology and it is then capped to prevent any ingress of dirt, and a chlorination certificate is completed detailing all facts and figures of the chlorination. All samples are sent away for analysis by a UKAS accredited laboratory.

What Now?

Your chlorination has now been carried out and you have your certificate of chlorination. This section details what to do next.

The client or main contractor will require the completed chlorination certificate below. If microbiological samples have been taken then once completed these will be provided under a separate cover and should be presented with this certificate of chlorination. If in doubt check with the main contractor as to the original specifications and what steps should be taken. This certificate should be placed into the O&M manual for future reference and inspection.

Microbiology results should be provided to you within 7 days and you will need these prior to being allowed to connect. Copies of the chlorination certificate and the laboratory microbiology report must be forwarded together to the Water Authority responsible for your connection. Do not send just the chlorination certificate as it is not adequate alone. Store both the microbiology report and chlorination certificate together for future reference.

Please note that a chlorination certificate is generally valid for a limited time period and connections must be carried out within the time period determined by your Water Authority. Failure to do so may render the chlorination certificate unacceptable.



Water Mains Disinfection Certificate (BS 8558:2011)

Site Details			
Site Location	Example		
Site Name	Example		
Site Contact	Balfour	Date	22/02/2014

WHS Engineer					
Name	Joel Green	EUSR Number	185160	CSCS Number	1885371

Job Details

Pipe Details			
System Type	New Mains Installation		
Pipe Designation	New mains pipe work for drinking water supplies and fire hydrant points.		
Pipe Material	Barrier Pipe MDPE (Protectaline)		
Pipe Diameter	125/32 mm	Pipe Length	250/300 m

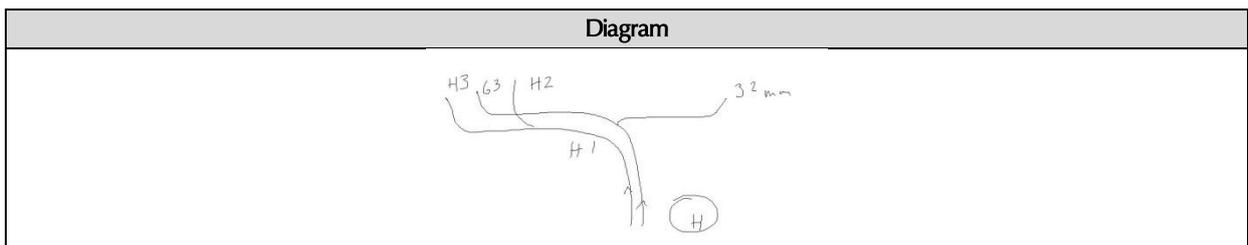
Source Water			
Water Supply Used	Hydrant		
Water Supply Free Cl ₂	0.05 ppm	Water Supply Flow Rate	250 L/min

Swabbing			
Swabbing Performed	Double Volume Flush	Swab Size	N/A
Pipe Flush Time	60 mins		

Chlorination Phase		
Disinfectant Used	Sodium Hypochlorite	
Location	Free Cl ₂ Level Start	
Sprinkler tank hydrant (3)	92 ppm	
Courtyard hydrant (2)	88 ppm	
Site vehicle entrance hydrant (1)	94 ppm	
32 mm plant room 1	97 ppm	
63 mm plant room 2	89 ppm	
Location	Free Cl ₂ Level End	
Courtyard hydrant (2)	82 ppm	
Site vehicle entrance hydrant (1)	87 ppm	
Sprinkler tank hydrant (3)	80 ppm	
32 mm Pipe End Room 1	93 ppm	
63 mm Pipe End Room 2	75 ppm	
Chlorine Contact Time	60 mins	
Post Contact Flush Time	90 mins	

Post Chlorination Phase			
Location	Free Cl ₂ Level	Total Cl ₂ Level	Turbidity
Hydrant 3	0.10 ppm	0.14 ppm	0.25 NTU
Hydrant 1	0.07 ppm	0.11 ppm	0.24 NTU
Hydrant 2	0.09 ppm	0.14 ppm	0.28 NTU
32 mm pipe end	0.06 ppm	0.09 ppm	0.21 NTU
63 mm pipe end	0.08 ppm	0.12 ppm	0.24 NTU
Site mains supply	0.06 ppm	0.09 ppm	0.19 NTU
Taste Odour & Appearance	Good clear appearance and clean taste with no discernible odour.		
Pipe Capped	Yes		

Samples	
Location	Sample Type
Supply Water Source	TVC, E. Coli, Coliforms
Hydrant (2) courtyard	TVC, E. Coli, Coliforms
Site mains supply	TVC, E. Coli, Coliforms
Hydrant (3) sprinkler tank	TVC, E. Coli, Coliforms
32 mm pipe end room 1	TVC, E. Coli, Coliforms
63 mm pipe end room 2	TVC, E. Coli, Coliforms
Pipe End	TVC, E. Coli, Coliforms
Hydrant (1) vehicle entrance	TVC, E. Coli, Coliforms



Photographs	
	View of pipe work run
	View of end cap fitted
	View of stop tap fitted

Comments
<p>Chlorination of new mains water pipework. Both fire main and drinking water main was part of the chlorination. Chlorination included 3 hydrants at various points on site and 2 tank supplies. All services were brought to the required levels of chlorine and left to contact for 1 hour. Post hour the system as a whole was completely flushed and all chlorine was neutralised and removed. Samples from each outlet were taken for continuity of the test. All hydrants were left isolated and both tank feeds were also left isolated. Samples sent 22/02/14</p>

Signatures	
Client Signature	
Client Name	Balfour
WHS Signature	
WHS Name	Joel Green

Disinfection Of Mains Supplies & New Lay Mains Pipe Work

Disinfection

General

The following disinfection procedure is designed to remove bacterial contamination from either new mains pipe work, refurbished or altered mains pipe systems or a mains supply system that has produced a high bacterial count. If systems are heavily contaminated or show presence of biofilm then additional methods may be required to remove this from pipe work internals.

It is important to ensure that when chlorinating mains water systems that all precautions are taken to ensure no backflow of chlorinated water can occur and contaminate the mains supply. It is also important to ensure that people working within the area fed by the water system are informed and cannot accidentally come into contact with chemically treated water.

Disinfection Procedure

1. Sign into site and obtain necessary permits to work
2. Perform full risk assessment of the area around the system to be disinfected and note pipe diameter, length and produce a rough diagram of the system.
3. Before any disinfection procedure begins place warning boards in good view. Inform relevant site staff, particularly if the water supply is to be disrupted and ensure all staff fully understand the length of service loss and relevant consequences.
4. Ensure that all outlets are clearly labeled with laminated warning signs quoting "CHEMICAL DISINFECTION IN PROGRESS DO NOT USE WATER". This will ensure complete safety of all people in the area during the works.
5. Before commencing work flush the incoming water at full bore for at least 10mins, this must be done before every chlorination starts with no exceptions. Whilst flushing measure flow rate in L/min and take a water sample of the incoming water to be used for the chlorination. Label as "Sample 1, name of job". Note the location and type of water supply and measure and record the free chlorine level.
6. Break into incoming pipe work/or locate pipe end and attach relevant adaptors to allow fitting of a clean hoses. All hoses used must be clean, previously disinfected and free from damage. Ensure double check valves are in place to prevent backflow.
7. If swabbing is required flush the pipe work with 2 volumes of water at maximum pressure and/or pass chlorinated foam swab into the system and push down the pipe work with water. Remove chlorinated foam swab.
8. Attach hoses from incoming mains/water supply into inlet side of chlorination equipment. Test flow is present through the system.
9. Attach hose from outlet side of chlorination equipment into feed side of mains fed system.
10. Place pickup pipe of chlorination equipment into sodium hypochlorite solution in bunded container and prime.

11. Ensure connections are tight and open mains stop valve.
12. Open outlets and pull chlorinated water through to all outlets, ensuring >50ppm of chlorine appears at all outlets.
13. Measure free chlorine content at pipe end or nearest and furthest outlets on each leg of pipe work with digital photometer to gain an accurate reading of free chlorine level and note results.
14. Once adequate free chlorine levels have been achieved at all outlets turn off all valves to further protect against backflow.
15. Allow the chlorine solution to stand within the pipe work for at least 1 hour or overnight as required by the Water Authority.
16. Turn back on all valves and turn off chlorination equipment.
17. Open mains stop tap/water supply tap.
18. Check chlorine levels at outlets to ensure they have remained >35 ppm and record results. If levels have dropped below 35 ppm then return to section 8 and re-start chlorination procedure.
19. If chlorine levels are >35 ppm then begin to draw water through the system to remove chlorinated water. If chlorinated water is not entering a specific foul drain or is of high volume (>500 L) then de-chlorination of the water must be undertaken. Sodium thiosulphate should be dosed into the outgoing water to fully neutralise the chlorine. Regular checks should be made to ensure all chlorine has been neutralised.
20. Continue to flush outlets until all outlets are showing identical chlorine levels to that of the incoming mains water.
21. Take required number of water samples and sample water for free chlorine, total chlorine and turbidity as standard. If required perform further chemistry samples and note all results.
22. Take water sample from the furthest outlet and label as "Sample 2, name of job and outlet" and take any further samples required by the client. Check water for odour, taste and appearance and note results.
23. Shut off mains stop tap/water supply and disconnect chlorination equipment. Take care to minimise loss of water from the system.
24. Reconnect mains system pipe work originally broken and turn on mains stop tap to check for leaks or cap off pipe ends with disinfected end caps.
25. Remove lock offs and signs, sign off certificate, inform site staff and sign off any work permits. Remove all debris and tools from the site prior to signing out.

Note!! Ensure that all outlets return initial chlorine levels of at least 50 ppm free chlorine and that this remains higher than 35 ppm of chlorine after 1 hour. Failure to do so means failure to comply with BS8558:2011.

HEALTH & SAFETY

DISINFECTION



CHEMICAL HANDLING



SITE SPECIFIC AS REQUIRED



ABOUT WATER HYGIENE SOLUTIONS LTD

Water Hygiene Solutions Ltd is a specialist technical water hygiene company providing services including cleaning and chlorination work, water hygiene consultancy, water treatment chemicals and equipment.

We have an excellent reputation nationwide both for the quality of work we undertake and the expertise and experience of our staff. Our can do attitude ensures that our clients obtain the work they require when they require it, particularly important when deadlines are looming.

With a commitment to staff development and with significant health and safety budget you can be assured of a quality service every time.

OUR SERVICES INCLUDE



Water Tank Cleaning - Regardless of the type of water system it is important that water hygiene is maintained. Water storage tanks especially require regular cleaning to remove debris and bacteria build up and maintain hygiene. Even new water tanks should be chlorinated prior to use to maintain potable water quality. Our specialist teams and equipment can provide cleaning and chlorination of all types and sizes of domestic and industrial water tanks including underground rain water harvesting tanks.



Legionella Management - It is vital to ensure that systems do not pose a risk of Legionnaires Disease and operate within the HSE guidelines. By carrying out bespoke water hygiene risk assessments we are able to determine the risks and provide advice on how to reduce these. It also allows us to design a Legionella control program based on current legislation. Our trained hygiene engineers can provide testing and monitoring of your site to ensure Legionella risk is managed at all times. A site specific log book for records ensures legislative compliance.



Chlorine Dioxide Water Treatment – Chlorine dioxide is an ideal water treatment option to reduce bacteria numbers and maintain water hygiene. It has applications both in potable water supplies for the control of Legionella and general water hygiene and also in process systems such as food manufacturing where bacterial control is important. We provide safe generation and dosage of chlorine dioxide in all applications with chemical supply and routine service.



Boiler Water Treatment - Correct steam boiler management is essential as the lack of, or failure, of a water treatment regime will rapidly lead to increased fuel costs and maintenance bills and will, over time, damage steam plant. Through a full analysis of your water conditions and steam process systems we offer a tailored boiler water treatment program to include pre-treatment plant and chemical water conditioning. Routine analysis by our experienced water treatment engineers ensures continued efficiencies.



Cooling Tower Management - The correct management of cooling towers and evaporative condensers is essential to ensure long life, efficiency and to prevent health hazards from Legionella growth. Our water treatment engineers use in depth water analysis to develop bespoke chemical treatment programs. Service contracts provide routine analysis, monitoring and cleaning to ensure that your cooling tower remains efficient and safe and you remain compliant with HSE guidance.



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