



Guidance Document
 SPS 382.50 Health Care and Related Facilities
 Hot Water Maintenance
CHLORINE DIOXIDE DISINFECTION

Issue Date: August 25, 2016

BACKGROUND	Potable hot water in a hospital, community-based residential facility, inpatient hospice or nursing home shall include a method or device for disinfection of the hot water distribution system. The storing and circulation of hot water shall be either initiated at a minimum of 140°F with a return of a minimum of 124°F, chlorinated at 2 mg/L residual, or disinfected by another system approved by the department.
GOALS OF RULES AND POLICIES	The goal of this guidance document is to protect public health of inpatients within a health care facility by disinfection of the hot water supply system.
APPLICABLE RULES	Wisconsin Administrative Code: SPS 382.20 , SPS 382.22 , SPS 382.40 , SPS 382.41 , SPS 382.50 , NR 809.561 , NR 809.565 , NR 809.80 Alternate Product Approval File No: 20110370
APPLICABLE POLICY ON ALTERNATE	The use of chlorine dioxide is “another disinfection system” approved by the department for compliance to SPS 382.50(3)(b)6.c. The installation of a water treatment device requires department plan review under SPS 382.20. The following procedures and documentation must be followed and maintained.
PROCEDURES	<ol style="list-style-type: none"> 1. The maximum residual disinfection level goals (MRDLGs) as per SPS 382.22, NR 809.561, NR 809.80: <ol style="list-style-type: none"> a. The maximum residual disinfectant concentration may not exceed 0.8 mg/L (as ClO₂). b. The minimum residual disinfectant concentration must be at least 0.2 mg/L (as ClO₂). c. The chlorite ion concentration shall not exceed 1.0 mg/L. d. The system shall be designed and installed to achieve the minimum inactivation rate (“CT” value). 2. As per SPS 382.22 and NR 809.565, a daily sample shall be taken at the nearest and the furthest point of hot water use from the injection location and tested for chlorine dioxide and chlorite concentration levels. <ol style="list-style-type: none"> a. All water systems (e.g. cold, cold soft) treated by the chlorine dioxide unit shall be tested for the maximum 0.8 mg/l concentration in compliance with SPS 382.40. b. Once a month an additional sample is to be taken in a location representative of average time. c. Water samples should be taken during the day for accurate disinfection levels. d. A record shall be kept of the daily water quality test data. The data shall include: <ol style="list-style-type: none"> i. Location of sample ii. Date & time sample taken iii. Sample result iv. Identification of person taking sample e. Water system owners are encouraged to routinely monitor the effectiveness of the water treatment system.

	<ol style="list-style-type: none"> 3. The water supply to the chlorine dioxide generator shall be protected by a cross-connection assembly conforming to ASSE 1013 and installed as per SPS 382.41. 4. An accessible hose bib shall be located in the area of the chlorine dioxide generator. 5. Chlorine dioxide generators should be maintained and serviced by qualified individuals. <p>Special Considerations</p> <p>An oxidant demand study should be completed to determine an approximate chlorine dioxide dosage to obtain the required CT value as a disinfectant. In addition to the toxic effects of chlorine, chlorine dioxide gas is explosive at levels > 10% in air. The chlorine dioxide dosage cannot exceed 1.4 mg/L to limit the total combined concentration of ClO₂, ClO₂⁻, ClO₃⁻, to a maximum of 1.0 mg/L. Under the proposed DBP regulations, the MRDL for chlorine dioxide is 0.8 mg/L and the MCL for chlorite is 1.0 mg/L. This means that if the oxidant demand is greater than about 1.4 mg/L, chlorine dioxide may not be used as a disinfectant because the chlorite/chlorate ions byproduct might exceed the maximum level allowed, unless inorganic byproducts (e.g. chlorite) are subsequently removed. There are numerous means to reduce excessive chlorite levels prior to chlorination in conventional water plants.</p>
DOCUMENTATION	<ol style="list-style-type: none"> 1. A record shall be kept on dates of cleaning, replacement of components or parts, and when the device was shutdown and the reason for shutdown. 2. Department and Health representatives shall be provided access to the water treatment system and records upon request.
NOTIFICATION	<p>The Department of Health Services is to be cc'd as part of this approval. Email to: David R. Soens, Director, david.soens@dhs.wisconsin.gov</p>
DEPARTMENT TRACKING	<p>The Division of Industry Services reserves the right to amend/revise this document as conditions arise making them necessary for code compliance and/or to protect public health and the waters of the state.</p> <p>For more information contact a Wisconsin Department of Safety and Professional Services Plumbing Consultant at 608-267-9421 or send an e-mail to DspsSbPlbgTech@wisconsin.gov</p>