

Basic Practical Treatment Applications

Drinking water treatment operators interact with disinfectants and their related processes daily. Having a baseline understanding of disinfection process management and related water quality parameters is essential for protecting public health.

Basic Practical Treatment Applications (6-hour block)

Training Objectives and Learning Outcome:

This 6-hour course will cover the practical application of chlorination for disinfecting public water system supplies and well it works to keep your customers safe from waterborne pathogens. Drinking water treatment plant operators will learn how to properly manage, monitor, and control disinfection processes. You will have a better understanding of the why and how of chlorination and be able to keep a more consistent chlorine residual throughout your system.

Attendees will learn:

- Application of the disinfection process using chlorine and hypochlorite
- Understanding of the breakpoint chlorination process
- Identify the points of disinfectant application and select the proper dosage
- Sample calculations: chlorine feed rate, dose, and demand versus residual
- Best management practices to manage chlorine residual throughout the distribution system
- Start up, shut down, troubleshoot, and maintain disinfection equipment and systems
- Handle disinfectants safely and develop and conduct a chlorine safety program

Agenda:

- 08:30-08:45: Introduction and agenda
- 08:45-09:00: Pre-test
- 09:00-10:00: Why do we disinfect? (25 slides)
 - History of drinking water disinfection
 - Pathogens
 - Disease outbreaks
 - Intrusion of contaminants into distribution systems
- 10:00-10:15: Break
- 10:15-11:15: Disinfectant overview
 - Types of disinfectants (9 slides)
 - Disinfection Chemistry (17 slides)
 - Types of Chlorine disinfectants
 - Secret life of Bleach video (2 min)
 - General disinfectant chemistry
 - Breakpoint chlorination graph
 - Exercise (math) 15 min
- 11:15-11:30: Break
- 11:30-12:30: Practical Application of Chlorine disinfectants (105 slides)
 - Calcium Hypochlorite/Sodium Hypochlorite/Elemental Chlorine (6 slides)
 - Application of chlorine gas (18 slides)

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- Application of Sodium Hypochlorite (30 slides)
- Chlorine gas safety (6 slides)
- 12:30-13:30: Lunch
- 13:30-14:30: Chlorine safety
 - Sodium hypochlorite safety (46 slides)
 - Chlorine Institute safety video (25 min)
- 14:30-14:45: Break
- 14:45-15:30: Chlorine dosage calculations (14 slides)
 - Area, Volume, Davidson pie
 - CT Calculations
 - CT Calculation exercise
- 15:30-15:45: Break
- 15:45-16:00: Managing residuals in your distribution system (12 slides)
 - Responding to sudden low residual
 - Responding to chronic low residual
 - Bacteriological control tests
 - Resources (2 slides)
- 16:00-16:15: Disinfection Jeopardy (30 minutes)
- 16:15-16:30: Posttest, session wrap-up, evaluations
- 16:30: Adjourn, 6 hours of content excluding breaks and lunch