

Controlling *Legionella* in Decorative Fountains

Purpose

Use this document to:

1. Help evaluate hazardous conditions associated with decorative or ornamental fountains (“decorative fountains”)
2. Implement *Legionella* control measures for decorative fountains per [ASHRAE Guideline 12](#)
3. Complement existing resources for water management programs
4. Support environmental assessments conducted during public health investigations

Key Points

- All decorative fountains produce aerosols.
- Do not place decorative fountains in areas intended for use by persons at increased risk of Legionnaires’ disease, such as healthcare facilities.
- Cleaning and disinfection are a regular part of decorative fountain operation and maintenance.

Sediment and biofilm, Temperature, water Age, and disinfectant Residuals (STAR) are the key factors that affect *Legionella* growth in decorative fountains.

Design

Understanding the decorative fountain design components are critical for *Legionella* control. Consider how each of the following impacts factors for *Legionella* growth: size, pumps, lighting, filtration, water treatment systems, and features (e.g., cascades, sprays, water walls). Decorative fountains should be supplied with a cold potable water make-up source at temperatures below the favorable range for *Legionella* (77–113°F, 25–45°C).

Operation, Maintenance, and Control Limits

All decorative fountains produce aerosols. Safe operation and regular decorative fountain maintenance protect building owners, employees, and visitors from exposure to *Legionella*. The frequency of these activities depends on the environmental conditions present in the area where the decorative fountain is located and its design. Use a water management program to establish, track, and improve operation and maintenance activities. Operate and maintain decorative fountains of all types and sizes with the following guidelines in mind:

- Follow manufacturer recommendations and any requirements of the authority having jurisdiction.
- Do not operate decorative fountains in areas intended for use by persons at increased risk of Legionnaires' disease, such as healthcare facilities.
- Monitor critical water parameters, like temperature and disinfectant residual, at least weekly.
- Automate disinfectant feed and monitoring systems, if possible.
- Apply algaecide as needed.
- Avoid prolonged idle periods and run decorative fountains at least daily.
- Immediately clean and disinfect if cloudy water, visible debris, algae, biofilm, or foul odor are present.
- Consider testing for *Legionella* in accordance with Routine Testing for *Legionella* (Page F1). Any detection of viable *Legionella* in decorative fountains should prompt a response, including a review of the water management program and corrective actions (Page F25).

Remediation

If an outbreak or illness is suspected, test in conjunction with public health in order to:

- Confirm the presence of *Legionella* before performing remediation.
- Confirm elimination of *Legionella* after remediation activities.

[ASHRAE Guideline 12](#) does not define remedial treatment procedures for decorative fountains. The following procedures are adapted from the ASHRAE Guideline 12 heated whirlpool and spa/hot tub remedial treatment procedure.

If control measures are ineffective or if routine test results indicate poor *Legionella* control, and there are NO illnesses, then consider the following remediation steps:

1. **Remove** the decorative fountain from service.
2. **Hyperchlorinate**, maintaining 10 ppm free chlorine for one hour.
3. **Drain** the water once shock disinfection is completed.
4. **Scrub** all surfaces.
5. **Clean** and service filters (if applicable).
6. **Refill** with fresh potable water.
7. **Return** the decorative fountain to the routine disinfectant residual level outlined in Table 4 before use.

If an associated outbreak or illness is suspected by the public health authority having jurisdiction (AHJ), do the following. Note: The public health AHJ determines whether there are associated illness(es) or an outbreak.

1. **Remove** the decorative fountain from service.
2. **Drain** the decorative fountain.
3. **Scrub** all surfaces.
4. **Replace** filters or filter media (if applicable).
5. **Repair** parts as needed.
6. **Refill** the decorative fountain.
7. **Hyperchlorinate**, maintaining a minimum of 20 ppm free chlorine for 10 hours.
8. **Drain** and rinse all components of the decorative fountain.
9. **Refill** with fresh potable water.
10. **Return** the decorative fountain to the routine disinfectant residual level outlined in Table 4 before use.

Table 4. *Legionella* Control Measures for Decorative Fountains by Volume in US Gallons

Water Parameter		Control Measure	Recommendations		
			< 5 gallons	5–25 gallons	> 25 gallons
S	Sediment and Biofilm	Cleaning frequency	Weekly	Monthly	Routinely to remove scale and deposits as indicated by water quality measurements.
			Any time there is visible biofilm or debris (in addition to above routine cleaning)		
T	Temperature	Control limits	Maintain water temperature below 77°F (25°C).*		
A	Water Age	Water turnover, flow, replacement	Water turnover and flow are needed to maintain water treatment applied for microbial control. Avoid idle periods. Run at least daily.		
R	Disinfectant Residual*	Control limits	3–5 ppm free chlorine for at least 1 hour per day	3–5 ppm free chlorine for at least 1 hour per day	0.5 ppm free chlorine for at least 6 hours/day

* Exposure to warm air, heat-generating submerged lights, or other factors that elevate water temperature into the favorable growth range (77–113°F, 25–45°C) will require additional mitigation strategies.

Resources

- Toolkit for Controlling *Legionella* in Common Sources of Exposure: <https://www.cdc.gov/control-legionella/php/toolkit/control-toolkit.html>
- Toolkit: Developing a Water Management Program to Reduce *Legionella* Growth and Spread in Buildings: <https://www.cdc.gov/control-legionella/php/toolkit/wmp-toolkit.html>
- *Legionella* Environmental Assessment Form: <https://www.cdc.gov/investigate-legionella/Legionella-Environmental-Assessment-Form.pdf>
- PreventLD Training: <https://www.cdc.gov/control-legionella/php/training/index.html>
- ASHRAE Guideline 12: <https://www.ashrae.org/technical-resources/standards-and-guidelines/guidance-for-water-system-risk-management>