



Massachusetts Department of Environmental Protection
Division of Water Supply
One Winter Street
Boston, Massachusetts 02108-4746

connected to the dishwashing system's water supply line. Until the owner installed an approved backflow preventer, the restaurant was required to stop using the chemical drying agent.

Further investigation revealed that the actual cause of the cross connection was a malfunction in the soda dispensing system. The pump was continuously engaged, creating suction within the restaurant's internal plumbing. The chemical drying agent was sucked back into the dishwashing system supply line, then throughout the restaurant. As a result, several customers and employees drank the chemical-tainted water and became sick.

What are the regulations governing cross connections?

The Massachusetts Plumbing Code (248 CMR 2.14) and the Massachusetts Drinking Water Regulations (310 CMR 22.22) both require installation of backflow preventers at all cross connections. Several types of backflow preventers are available: reduced pressure backflow preventers (RPs), double check valve assemblies (DCVAs), air gap separations with tank and pump arrangements, atmospheric vacuum breakers (AVBs), pressure vacuum breakers (PVBs), and barometric loops. The type of device that is appropriate for your business depends on the degree of hazard associated with the particular cross connection. All backflow preventers require a local plumbing permit. Some devices – RPs, DCVAs and air gaps – also must be approved by DEP or its designee before they are installed. The DEP permit must be renewed every year.

State regulations also require periodic

testing of RPs, air gaps and DCVAs to ensure that they continue to protect the drinking water system and public health. RPs and air gaps must be tested twice annually by the water supplier and once a year by an independent certified backflow prevention device tester hired by the owner. DCVAs must be tested annually by the water supplier.

What is the cost of providing adequate cross connection protection in a restaurant?

The typical cost of a needed device in a restaurant is approximately \$300, depending on the size and type, as well as the plumbing configuration and water pressure within the building. Since a backflow preventer may be the only barrier between your customers and contaminated water, your investment in installing and keeping the equipment maintained is minimal compared to the potential liability of a backflow incident.

Where can I get more information?

The DEP Division of Water Supply has a number of helpful publications regarding cross connections. Call (617) 292-5770 or fill out the attached request form.

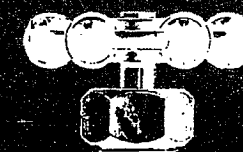
Prepared by the Massachusetts
Department of Environmental
Protection, Office of Public
Affairs, One Winter Street,
Boston, MA 02108, March
1994. Printed on recycled paper.



Cross Connections

A Guide for Massachusetts Restaurant

Owners



The Commonwealth of
Massachusetts

Executive Office of
Environmental Affairs

Department of
Environmental Protection

You as a restaurant owner must protect your drinking water system and the health of your employees, customers and neighbors by preventing or protecting all cross connections within your premises.

What is a cross connection?

A cross connection occurs whenever a potable drinking water line is directly or indirectly linked with a nonpotable piece of equipment or piping. Examples of nonpotable equipment typically found in a restaurant include dishwashers, hoodwashers, air conditioning systems, fire protection systems, power washing systems, boilers, and post-mix beverage machines.

Why should I be concerned?

An unprotected or inadequately protected cross connection on your premises could contaminate the drinking water not only in your restaurant, but in the lines that supply neighboring homes and businesses.

Severe illnesses and injuries – even death – have resulted from cross connection contamination events that could have been prevented. Such events have been known to cause outbreaks of hepatitis A, gastroenteritis, Legionnaire’s disease, chemical poisoning and body lesions (from exposure through showering). They also can rupture plumbing fixtures and cause explosions.

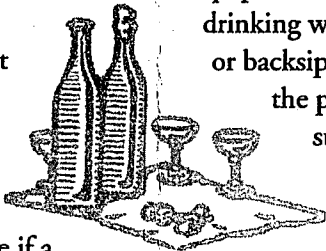


What is my liability?

You are responsible for all unprotected or inadequately protected cross connections on your premises, and liable for any damages or illnesses they may cause. In cases where business owners have been proven to be at fault for cross connection contamination events, judges and juries have awarded plaintiffs substantial monetary damages. Additionally, local and state fines of up to \$25,000 per day are possible if a restaurant owner fails to adequately protect a cross connection and places the public’s health at risk or damages the environment.

What is my responsibility as a restaurant owner?

You must have your facility surveyed by your local water department to determine if any cross connections exist. You may want to expedite this process and get prepared for the water department’s survey by having your facility pre-surveyed by a plumbing contractor. Each cross connection must be eliminated or properly protected by an appropriate backflow preventer. All work done on the internal plumbing system of your facility must be performed by a Massachusetts licensed plumber. Any changes to your plumbing must be approved by your local plumbing inspector and public water supplier as necessary.



How can a cross connection contamination event occur?

Nonpotable water or chemicals used in equipment or a system can end up in the drinking water line as a result of backpressure or backsiphonage. Backpressure occurs when the pressure in the equipment or system such as a boiler or air conditioning unit is greater than the pressure inside the drinking water line. Backsiphonage occurs when the pressure in the drinking water line drops (due to fairly routine occurrences such as main breaks, nearby fires, unusually heavy water demand, etc.) and contaminants are sucked out of the system and into the drinking water line.

But have things like that ever happened in a Massachusetts restaurant?

Yes, they have, and all too often despite the efforts of local water suppliers and DEP. In one recent example, a restaurant manager complained to the local water department about blue-colored water coming out of faucets, the coffee system, and the soda dispensing system. The water also had an odor and a bad taste. The water department responded by performing a cross connection survey at the restaurant. The survey revealed that the source of the discolored water was a feed line that carried a chemical drying agent to the dishwashing system. The feed line had been improperly

For more information, fill out the following and mail to: **DEP Division of Water Supply, One Winter Street, Boston, MA 02108.**

- Check which information you would like to receive:
- ☐ Cross connection regulations (310 CMR 22.22)
 - ☐ Cross connection guide for business owners
 - ☐ Cross connection information regarding fire sprinkler systems

Name

Company

Address

City/Town

Zip Code