

Backflow Prevention What Does it Mean to You?

We Take Clean Water for Granted...

Every time you fill a glass with water from the tap, prepare a meal, or take a bath, you take for granted that the water will always be clean, pure, and healthy.

Occasionally, situations occur outside of our control that can jeopardize the quality of your drinking water. A very common occurrence in a water distribution system is the temporary loss of pressure due to the breakage of a water supply pipe or water main.

When these situations occur, conditions are present that can allow the backflow of pollutants or contaminants into the water system and threaten the purity of our drinking water system.

Frequently Asked Questions

Questions and Answers About Cross-Connection Control

QUESTION: What is a cross-connection?

ANSWER: A cross-connection is any temporary or permanent connection between a public water system or consumer's potable (i.e., drinking) water system and any source or system containing non-potable water or other substances. An example is the piping between a public water system or consumer's potable water system and an auxiliary water system, cooling system, or irrigation system.

QUESTION: What are Potential Contamination Hazards from Cross-Connections?

ANSWER: Potential threats to a drinking water supply include, but are not limited to:

- chemical plants using equipment connected to the public water supply
- hospitals
- mortuaries
- medical, dental, and veterinary clinics
- laboratories
- irrigation and lawn-sprinkler systems
- marinas
- connections with an auxiliary water supply, which could be polluted

QUESTION: What is backflow?

ANSWER: Backflow is the undesirable reversal of flow of non-potable water or other substances through a cross-connection and into the piping of a public water system or consumer's potable water system. There are two types of backflow... backpressure backflow and backsiphonage.

QUESTION: What is backpressure backflow?

ANSWER: Backpressure backflow is backflow caused by a downstream pressure that is greater than the upstream or supply pressure in a public water system or consumer's potable water system. Backpressure (i.e., downstream pressure that is greater than the potable water supply pressure) can result from an increase in downstream pressure, a reduction in the potable water supply pressure, or a combination of both. Increases in downstream pressure can be created by pumps, temperature increases in boilers, etc. Reductions in potable water supply pressure occur whenever the amount of water being used exceeds the amount of water being supplied, such as during water line flushing, firefighting, or breaks in water mains.

QUESTION: What is backsiphonage?

ANSWER: Backsiphonage is backflow caused by a negative pressure (i.e., a vacuum ~ or partial vacuum) in a Public water system or consumer's potable water system. The effect is similar to drinking water through a straw. Backsiphonage can occur when there is a stoppage of water supply due to nearby firefighting, a break in a water main, etc.

QUESTION: Why do water suppliers need to control cross-connections and protect their public water systems against backflow?

ANSWER: Backflow into a public water system can pollute or contaminate the water in that system (i.e., backflow into a public water system can make the water in that system unusable or unsafe to drink), and each water supplier has a responsibility to provide water that is usable and safe to drink under all foreseeable circumstances. Furthermore, consumers generally have absolute faith that water delivered to them through a public water system is always safe to drink. For these reasons, each water supplier must take reasonable precautions to protect its public water system against backflow.

QUESTION: What should water suppliers do to control cross-connections and protect their public water systems against backflow?

ANSWER: Water suppliers usually do not have the capability to repeatedly inspect every consumer's premises for cross-connections and backflow protection. Alternatively, each water supplier should ensure that a proper backflow preventer is installed and maintained at the water service connection to each system or premises that poses a significant hazard to the public water system. Generally, this would include the water service connection to each dedicated fire protection system or irrigation piping system and the water service connection to each of the following types of premises:

1. premises with an auxiliary or reclaimed water system;
2. industrial, medical, laboratory, marine or other facilities where objectionable substances are handled in a way that could cause pollution or contamination of the public water system;
3. premises exempt from the State Plumbing Code and premises where an internal backflow preventer required under the State Plumbing Code is not properly installed or maintained;
4. classified or restricted facilities; and
5. tall buildings.

Each water supplier should also ensure that a proper backflow preventer is installed and maintained at each water loading station owned or operated by the water supplier.

QUESTION: What is a backflow preventer?

ANSWER: A backflow preventer is a means or mechanism to prevent backflow. The basic means of preventing backflow is an air gap, which either eliminates a cross-connection or provides a barrier to backflow. The basic mechanism for preventing backflow is a mechanical backflow preventer, which provides a physical barrier to backflow. The principal types of mechanical backflow preventer are the reduced-pressure principle assembly, the pressure vacuum breaker assembly, and the double check valve assembly. A secondary type of mechanical backflow preventer is the residential dual check valve.

QUESTION: Can Backflow be Prevented?

ANSWER: Yes, the backflow of undesirable elements into the drinking water system can be prevented. A cross-connection is a physical connection between the water supply and any source of possible pollution or contamination. By eliminating or controlling all actual or potential cross-connections, the public drinking water system will be protected within the city water main system and within buildings.

Simple plumbing changes can easily eliminate many cross-connections. However, where this is not possible, backflow prevention assemblies are installed to protect the water supply.

QUESTION: Who is responsible?

ANSWER: In Ohio, the responsibility for preventing backflow is divided. In general, state and local plumbing inspectors have authority over plumbing systems within buildings while Ohio EPA and water suppliers regulate protection of the distribution system at each service connection.

Water customers have the ultimate responsibility for properly maintaining their plumbing systems. It is the homeowner's or other customer's responsibility to ensure that cross-connections are not created and that any required backflow preventers are tested yearly and are in operable condition.

QUESTION: What is the law?

ANSWER: Ohio Administrative Code Chapter 3745-95 requires the public water supplier to protect the public water system from cross-connections and prevent backflow situations. The public water supplier must conduct cross-connection control inspections of their water customers' property to evaluate hazards. Local ordinances or water department regulations may also exist and must be followed in addition to state regulations. If a potential or actual cross-connection contamination hazard is identified, the customer will be required to eliminate the hazard and/or install an appropriate backflow preventer at the service connection and/or at the hazard.

QUESTION: What Can You Do?

ANSWER: First, you should determine if there are potential cross-connections in your home or business. The local plumbing inspector or water provider can assist in this determination.

Next, you should investigate alternatives for eliminating or protecting against all actual or potential cross-connections.

After determining the necessary method of cross-connection control, the appropriate plumbing changes or the addition of a mechanical backflow prevention assembly should be made.

Local codes or government regulations are used to determine what specific backflow prevention assemblies are required for each application. The local water provider should always be consulted prior to purchasing and installing any backflow prevention assembly.

Booster Pumps

QUESTION: What is the concern?

ANSWER: Booster pumps connected to plumbing systems or water mains can cause backsiphonage by reducing the water mains. The following requirements are in place to help prevent backsiphonage:

- Booster pumps, not used for fire suppression, must be equipped with a low suction cut-off switch that is tested and certified every year;
- Alternately, when a booster pump is necessary for one-, two- and three-family dwellings, it is preferred that the booster pump draw from a surge tank filled through an air gap; and
- Booster pumps, used in a fire suppression system, must be equipped with either a low suction throttling *valve* on the discharge side or be equipped with a variable speed suction limiting control system. Low-pressure cut-off *devices* will suffice for fire pumps installed prior to August 8, 2008, until a significant modification is warranted, at which point the minimum pressure sustaining method must be updated. Each of these methods must be tested and certified each year.

Contacts

Need more information?

Questions concerning backflow prevention and cross-connection control may be directed to your local water department or to your local Ohio EPA District Office at the following numbers:

Northwest District (419) 352-8461
Northeast District (330) 963-1200
Southwest District (937) 285-6357
Southeast District (740) 385-8501
Central District (614) 728-3778

Questions regarding internal plumbing in the home may be directed to your local plumbing authority or to the Ohio Department of Commerce, Plumbing Administrator, at (614) 644-3153.

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