What is a Cross Connection?

A cross connection is a point in a plumbing system when the potable water supply is connected to a non-potable source. Briefly, a cross connection exists whenever the drinking water system is or could be connected to any non-potable source (plumbing fixture, equipment used in any plumbing system). Pollutants or contaminants can enter the safe drinking water system through uncontrolled cross connections when backflow occurs.

Backflow is the unwanted flow of non-potable substances back into the consumer's plumbing system and/or public water system (i.e., drinking water).

There are two types of backflow: **backsiphonage** and **backpressure**.

Backsiphonage is caused by a negative pressure in the supply line to a facility or plumbing fixture. Backsiphonage may occur during waterline breaks, when repairs are made to the waterlines, when shutting the water supply off, etc.

Backpressure can occur when the potable water supply is connected to another system operated at a higher pressure or has the ability to create pressure, etc. Principal causes are booster pumps, pressure vessels, elevated plumbing, etc.

Backflow preventers are mechanical devices designed to prevent backflow through cross connections. However, for backflow preventers to protect as designed, they must meet stringent installations requirements.

For further information contact the Plumbing Inspectors in Environmental Health at the Mansfield/Ontario/Richland County Health Department 419-774-4525

Mansfield/Ontario/Richland County
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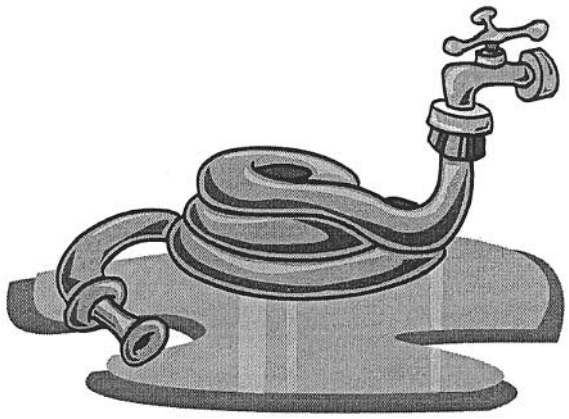
Some of the information in this brochure is courtesy of the PNWS/AWWA

Cross Connections can create Health Hazards

Drinking water systems may become

Polluted
or
Contaminated
through uncontrolled cross connections

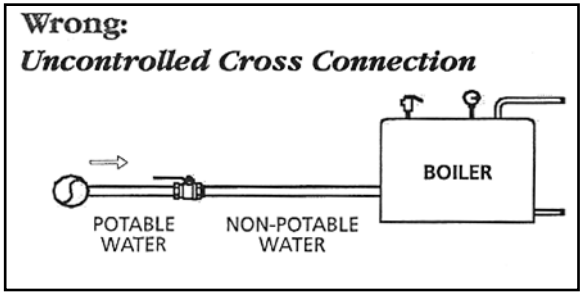


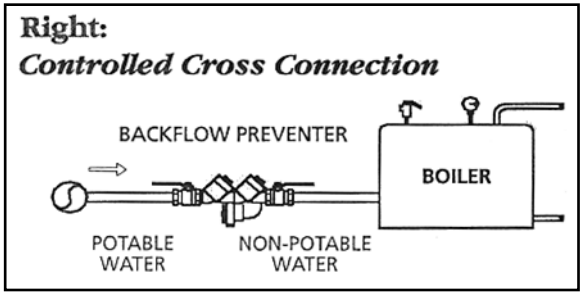
Mansfield/Ontario/Richland County Health Department

Why Be Concerned?

Most water systems in the United States use good sources of water and/or sophisticated treatment plants to convert impure water to meet drinking water standards. Millions of dollars are spent to make the water potable (meaning: safe to drink) before it enters the distribution system so most water purveyors think that their supplies are not in jeopardy from this point on. But drinking water systems may become polluted or contaminated in the distribution system through uncontrolled cross connections.

Cross connections are installed each day because people are unaware of the problems they can create. Death, illness, contaminated food products, and industrial and chemical products rendered useless are some of the consequences of such connections. Many dollars are lost due to cross connections.





Why Be Concerned?

Cross connections are found in all plumbing systems. It is important that each cross connection be identified and evaluated as to the type of backflow protection required to protect the drinking water supply. Some plumbing fixtures have built-in backflow protection in the form of a physical air gap. However, most cross connections will need to be controlled through the installation of an approved mechanical backflow prevention device or assembly. Some common cross connections found in plumbing and water systems include:

1. Wash basins and service sinks
2. Hose bibs
3. Irrigation sprinkler systems
4. Auxiliary water supplies
5. Laboratory and aspirator equipment
6. Photo developing equipment
7. Processing tanks
8. Boilers
9. Water recirculating systems
10. Swimming pools
11. Solar heat systems
12. Fire sprinkler systems

Every water systems has cross connections. Plumbing codes and State drinking water regulations require cross connections to be controlled by approved methods (physical air gap) or approved mechanical backflow prevention devices or assemblies. The various types of mechanical backflow preventers include: reduced pressure backflow assembly (RPBA), reduced pressure detector assembly (RPDA), double check valve assembly (DCVA), double check detector assembly (DCDA), pressure vacuum breaker assembly (PVBA), spill resistant vacuum breaker assembly (SVBA) and atmospheric vacuum breaker (AVB).

For a backflow preventer to provide proper protection, it must be approved for backflow protection, designed for the degree of hazard and backflow it is controlling, installed correctly, tested annually by a State certified tester, and repaired as necessary. Some states require mandatory backflow protection on certain facilities where high health hazard-type cross connections are normally found. The following is a partial list of those facilities:

1. Hospitals, mortuaries, clinics
2. Laboratories
3. Food and beverage processing
4. Metal plating and chemical plants
5. Car washes
6. Petroleum processing and storage plants
7. Radioactive processing plants and nuclear reactors
8. Piers and docks
9. Sewage treatment plants

It is impossible to cover all the information pertaining to cross connections in a pamphlet. We hope this information will inspire you to further educate yourself on the hazards of unprotected cross connections. Please contact the plumbing inspectors in the Environmental Health Division at the Mansfield/Ontario/Richland County Health Department if you need further information. Our number is 419-774-4525.