WHAT IS A CROSS CONNECTION?

Did you know?

The Safe Drinking Water Act of 1974 established national standards for drinking water. State and local governments or water utilities are charged with enforcing these standards, protecting the public water supply, and delivering safe drinking water. Yet cross connections can contaminate drinking water without anyone realizing it.

What is a cross connection?

A cross connection is an unprotected direct (or potential) connection between drinking water piping and a contamination source. This can be as simple as a garden hose that is submerged in a swimming pool, a bucket of detergent, or other contaminated water. Other examples are supply lines connected to boilers, process equipment, or bottom-fed tanks.
Under certain conditions, cross connections can allow tainted water to flow backward through the piping system and contaminate the drinking water. This is called backflow, and it's caused by two types of pressure changes: backsiphonage and backpressure.

What is backsiphonage?

Backsiphonage is caused by negative pressure from a vacuum (or partial vacuum) in the supply piping, just as drinking through a straw draws liquid from a glass. Backsiphonage can be created when there is stoppage in the water supply due to repairs or breaks in the city main; an increased demand at one location, such as fire fighting; or even undersized piping. Backsiphonage reverses normal flow in the system, and can pull contaminants into the drinking water.

What is backpressure?

Backpressure reverses normal system flow. It occurs when downstream water pressure is greater than the water supply pressure. This can occur in any pressurized system such as boilers, elevated tanks, or recalculating systems. For example, water in a boiler operating under a pressure of 15-20 psi would backflow into the potable water if its supply pressure fell below this level. Sometimes this pressure drop can be created just by flushing a toilet!

Do state and/or local regulations cover cross connections?

Yes. Unprotected cross connections with potable piping systems are prohibited, and Wisconsin water utilities have a mandatory cross connection control inspection program, as outlined in the Wisconsin Administrative Code, Department of Natural Resources, Chapter 811, section NR 811.09 and also the Department of Commerce, Comm 82. Plumbing and health officials, municipalities, and property owners have established a cooperative program to control cross connections and protect the public drinking water supply.

What's the difference between pollution and contamination?

Pollution of the water supply is usually caused by nontoxic substances, and often does not constitute an actual health hazard, although water may be nonpotable and affected with respect to taste, odor, or utility. Contamination, however, is a health hazard caused by a toxic substance, which subjects consumers to potentially lethal water-borne diseases or illnesses.

What is the difference between toxic and nontoxic substances?

Toxic substances are liquids, solids, or gases which, when introduced into the water supply, can endanger the health and well-being of consumers; examples include treated boiler water, heavy metals, industrial chemicals, and pesticides. Nontoxic substances are nuisances and/or aesthetic hazards that pollute, but don't contaminate, potable water; these include food, beverages, and debris.

What does "degree of hazard" mean?

This determines whether and to what extent a substance is a toxic contaminant and, by extension, a health hazard, or a nontoxic pollutant that generally presents an aesthetic hazard. Both types of substances can make drinking water nonpotable. Determining the degree of hazard helps determine the most appropriate type of backflow prevention device.

What methods or products protect against backflow?

Once the degree of hazard has been determined, the proper backflow prevention device can be installed. Plumbing specialists, working with municipal officials, determine which device is best suited to each situation. Five basic methods are used:

1) Air gap
2) Atmospheric vacuum breakers, including hose connection vacuum breakers
3) Pressure type vacuum breakers
4) Double check valve assembly
5) Reduced pressure principle backflow preventers.

Many cross connections can be corrected with a simple hose bib (faucet) vacuum breaker. This means equipping each hose connection, both outside and inside, with a simple and inexpensive vacuum breaker that can be obtained from hardware stores or plumbing shops for under $10 each. In other instances, more elaborate protective devices may be necessary.