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## Backflow Preventers

**Backflow** is defined as *the reversal of the normal and intended direction of water flow in a water supply system*. In order to prevent potential contamination of potable (drinkable) water supplies to buildings and homes, devices known as **Backflow Preventers** are installed in the main water

supply system. As Industry Professionals, it is helpful to be familiar with the basic operation of these devices



### BACKFLOW PROBLEM DESCRIPTION

Backflow in a water supply system has the potential to spread contaminated water through a fresh water distribution system, allowing non-drinkable, contaminated water to enter the

system causing potential health dangers to occupants if not mitigated.

One example of a backflow problem would be an uncontrolled cross connection that allows pollutants or contaminants to enter a public water supply. A **Cross-Connection** is defined as *any actual or potential connection between a public water supply system and a source of contaminated or polluted water*. Sickness can result from ingesting water that has been contaminated due to backflow.

### TWO CONDITIONS UNDER WHICH BACKFLOW CAN OCCUR

#### Back Pressure

**Back-pressure** is the reversal of the normal flow of water within a piping system as the result of the pressure downstream being higher than the supply pressure. This reduction in supply pressure can occur whenever the *amount of water being used exceeds the amount of water being supplied* (such as during water-line flushing, fire-fighting operations, or breaks in water mains).

#### Back-Siphoning

**Back-siphoning** is the reversal of the normal flow of water within a piping system that is caused by negative pressure in the supply piping (i.e. a vacuum or partial vacuum within the water supply piping). Back-siphoning can occur if there is a high velocity of water in a pipe line, if there is a line

repair or break that is lower than the service (supply) point, or when the main pressure in a pipe is lowered due to high water withdrawal (such as during fire-fighting or water-main flushing).

## REDUCED-PRESSURE BACKFLOW PREVENTER

This type of backflow preventer is the most common type you may see as an Industry Professional. The device consists of two or more independent check valves, plumbed in series, with a pressure monitored chamber between. The chamber is maintained at a pressure that is lower than the water supply pressure, but high enough to be useful downstream. A pressure relief valve automatically relieves excess pressure in the chamber by discharging to a drain or drain system.



Any visible water discharge from this type of backflow preventer device is usually an indication that either of the two check valves is *'passing'* (leaking past their shutoff seats) or the relief valve itself is faulty.

In the case of the *upstream* check valve passing, the differential pressure (higher supply pressure compared with the lower chamber pressure) causes any flow to occur only in one direction. A buildup of pressure in the chamber in such a case would be relieved to the drain.

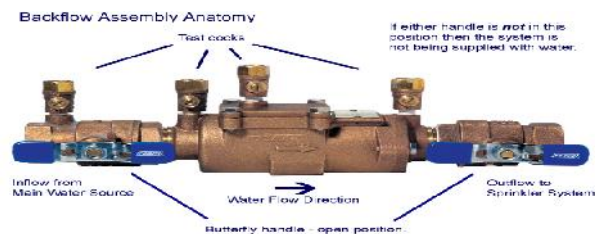
In the case of the *downstream* check valve passing, the differential backflow preventer pressure relief valve prevents the possibility of the chamber pressure from exceeding the supply pressure.

## TESTING THE BACKFLOW PREVENTER



A backflow preventer is usually tested with a device called a *differential gauge*. This gauge uses hoses attached to the various test ports of the reduced pressure zone and checks to be certain that the check valve springs as well as the relief valve spring are not fouled and are working properly.

Many municipalities require yearly testing of backflow preventer devices for residential and commercial properties.



Backflow preventers are a simple device that prevents contaminated water from entering a potable drinking water system. A basic understanding of their use and operation is helpful to all Industry Professionals, and can be very helpful when providing advice to clients. Of course, you can always contact your AccuTech Professional should you have any questions regarding this type of safety device.