

Food Protection

Lesson 11

Plumbing

Protecting the Water Supply

Plumbing must be sized and installed according to applicable codes. There should be no **cross-connection** between the potable water supply and any non-potable water supply. A plumbing connection through which contaminants from drains, sewers or waste pipes can **potentially** enter the drinkable water supply is called a cross-connection. This can result in the contamination of the potable water supply system and in a food establishment, is considered a public health hazard. Outbreaks of diseases have been traced back to cross-connections.

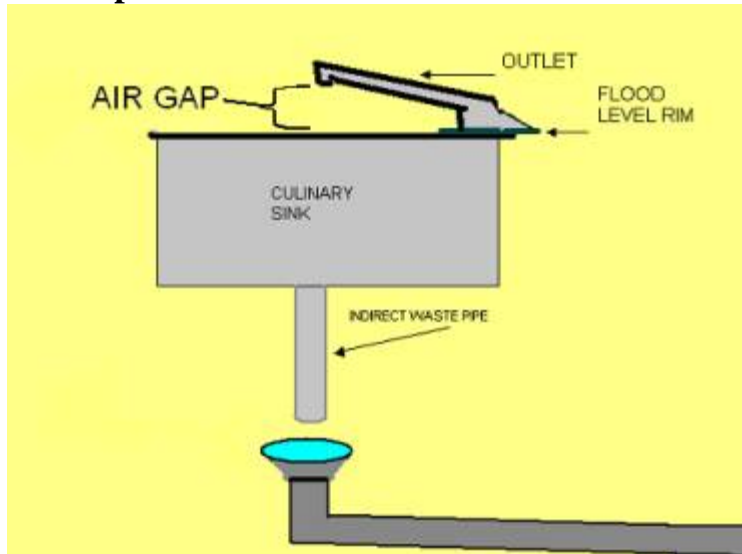
Cross-connections may be either direct or indirect. A direct cross-connection occurs when a drinkable water system is directly connected to a drain, sewer or non-potable water supply.

Where non-potable water systems are permitted for purposes such as air conditioning and fire protection, the non-potable water must not contact food, potable water or equipment that contacts food or utensils directly or indirectly. The piping of any non-potable water system should be clearly identified so that it is easily distinguished from piping that carries potable water. These non-potable pipes and sewer pipes are not permitted above food preparation or food storage areas.

Backflow prevention devices (below) protect the potable water from this contamination. Backflow may occur in two ways, back-pressure and back-siphonage. Back-pressure occurs when increased pressure from the non-potable pipes pushes unclean water into the potable water lines. Back-siphonage occurs when the pressure on the potable lines is decreased, and non-potable water is siphoned into the potable water supply.

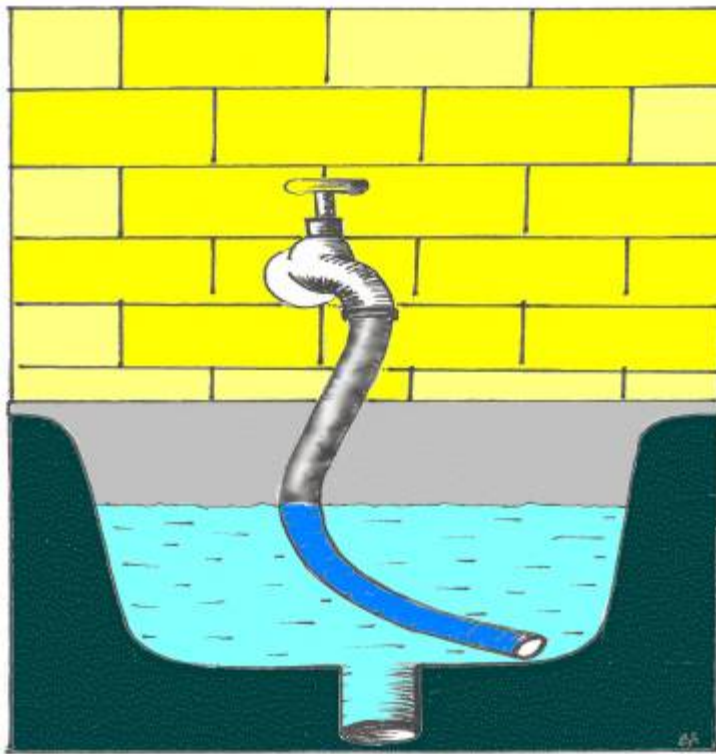
Backflow Prevention Devices

Air Gap



An **air gap** is the only completely reliable backflow prevention device. It is an unobstructed, vertical distance through the air separating an inlet of potable water from a potentially contaminated source. The length of the air gap, when used, must be at least twice the distance of the diameter of the water supply inlet, but not less than 1." In the case of a culinary sink the air gap is simply the distance from the end of the faucet (inlet) to the sink's flood-level rim.

The potable water system must be installed to prevent the possibility of backflow. Backflow prevention devices should be installed and maintained to protect against back-flow (and back-siphonage) at all fixtures and equipment unless an air gap is provided. These devices are called vacuum breakers. The following types are in general use:



(Hose submerged in water)

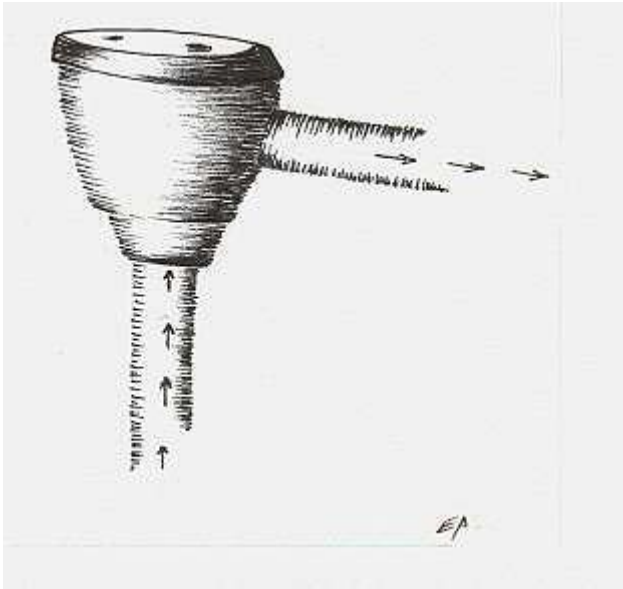
Hose-bib type vacuum breaker At a sink, where a hose is installed at the faucet, a **hose-bib type vacuum breaker** must be installed. It may be screwed directly onto a **threaded faucet** for a hose attachment. Further, hoses that are installed at sinks must **never** be submerged in water.



Threaded faucet



Hose bib vacuum breaker



Atmospheric Vacuum Breakers

Where potable water lines are connected directly to equipment, devices must be installed to prevent backflow. In the case of an ice or coffee machine, an **atmospheric vacuum breaker** must be installed. These devices prevent backflow caused by backpressure or backsiphonage in the plumbing system.

Double-Vented Check Valve



Diagram showing check valve

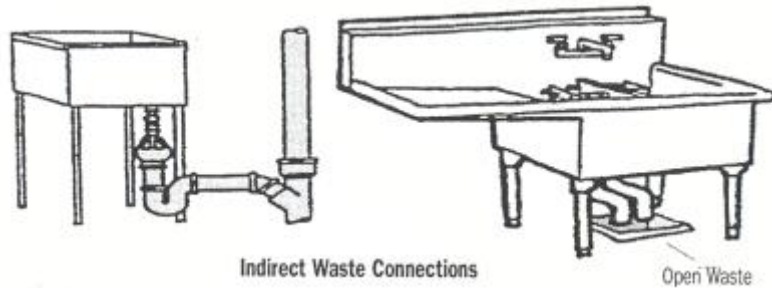
This device is used on soda carbonators to prevent the backflow of carbonated water into water supply pipes. A soda carbonator works by allowing the mixture of carbon dioxide gas with water and syrup to produce the soda. Since carbonated water is acidic, if allowed into water supply pipes it will erode the metal of these pipes and can cause metal poisoning. The double-vented check valve works by allowing the carbon dioxide to escape into the air during a backflow. In a soda system where the double-vented check valve is used, it must be available for inspection.

Fixtures and equipment requiring back-flow(back-siphonage) prevention:

- Sinks
- Steam tables
- Water closets
- Potato peelers
- Dishwashers
- Ice machines
- Urinals
- Garbage grinders

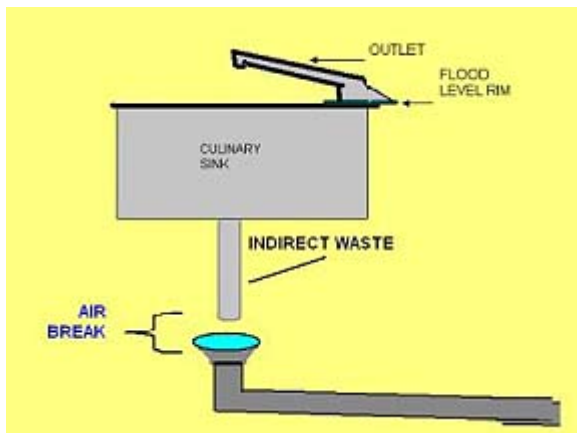
Protecting Sinks and Other Fixtures

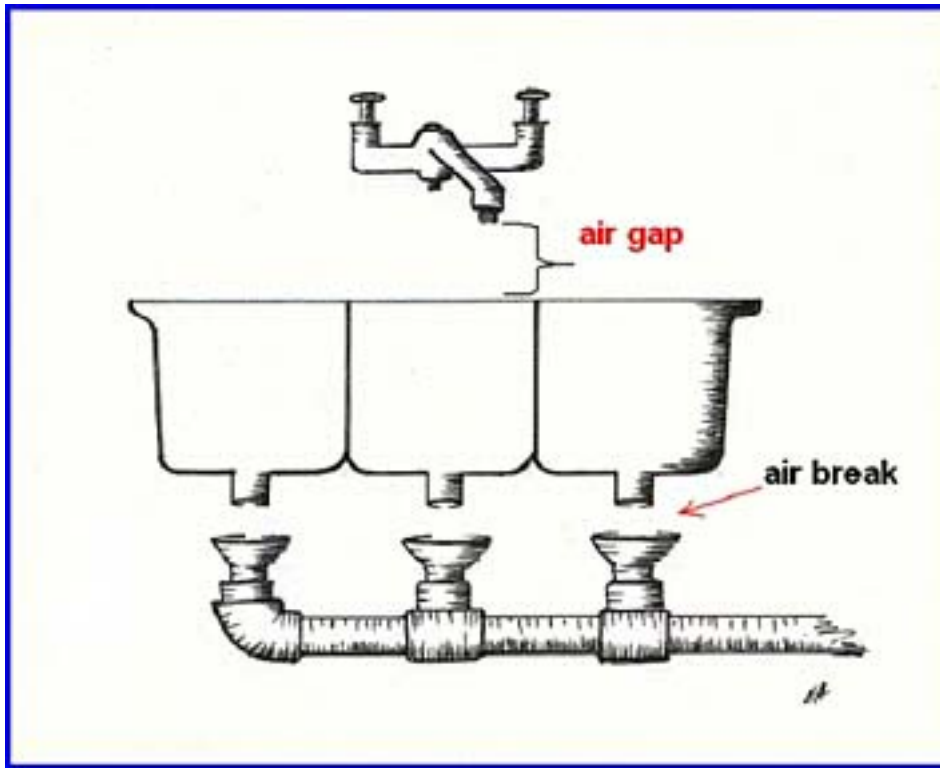
The backup of water from the sewer system and waste lines in a food preparation or food storage area is a serious public health hazard. This water contains contaminants and may cause illness. A faulty sewage disposal system or the presence of sewage on the floors, fixtures or food may result in the immediate closure of a food establishment. At the first sign of waste lines that drain slowly, a plumber should be consulted to clear the blockage before backup occurs.



In order to prevent sewage backup from contaminating equipment, there should be no **direct** connection between the sewage system and any drains originating from equipment in which food or food utensils are placed. In order to ensure that there is no direct connection between these lines, an **air break** must be installed. The air break thus provides **indirect waste**. Where pipes are indirectly wasted, sewage is prevented from contaminating equipment.

As shown in the diagram above and below, the air break interrupts the connection from the sink and the sewage line. This does not prevent sewage from backing up. However, it does prevent the sewage from reaching the sink. In the event of sewage backup, sewage will fall on the floor and not reach equipment.





An air break is an unobstructed, vertical distance through the air separating food-related equipment from a waste or sewer pipe. The space must be twice the distance of the diameter of the discharge opening or 1 inch, whichever is greater. An air break must be installed at each culinary or equipment sink. **An air break is not required at hand wash sinks.**

Unidirectional check valves or equivalent devices are not acceptable for this purpose. Indirect sewer connections should be located within 2 feet of the equipment, and on the inlet side of the grease interceptor. This is intended to protect the equipment.

Fixtures and equipment requiring indirect waste connections include:

- Food preparation and ware-washing sinks
- Refrigerators and freezers
- Ice makers and storage bins
- Steam tables and kettles
- Dipper wells

DIAGRAM 3

A grease interceptor should be installed in the waste line leading from pot washing sinks; floor drains receiving waste from soup or stock kettles, food scrap sinks, scullery sinks and the scraper section of commercial dishwashers to prevent grease from entering the drainage system.

Interceptors should remove an average of at least 90% of the grease or other extractable matter in the wastewater and should conform to the requirements of the New York City Department of Environmental Protection, Industrial Waste Control Section.

Grease interceptors

Grease interceptors shall be installed in waste lines which may receive grease from non-residential direct and indirect dischargers, including but not limited to those leading from pot wash sinks, woks, soup or stock kettles, food scrap sinks, scullery sinks, meat and/or poultry and/or fish preparation sinks, floor drains, automatic dishwashers, scraper sinks, or other similar plumbing fixtures, in all restaurants, kitchens, cafeterias, clubs, butcher shops, slaughterhouses, fish markets, supermarket food processing areas, delicatessens, or other non-residential establishments where grease may be introduced into the drainage system.

Fats, Oils, and Grease are prohibited from being discharged into the public sewer in order to prevent obstruction of sewer pipes and sewer backups.

Title 15 Rules of the City of New York, Chapter 19.

How Grease Interceptors Work

This equipment works by separating the fats, oils, and grease from the wastewater. Greasy wastewater entering the interceptor passes through a vented flow control fitting that regulates the flow of the wastewater. The wastewater then passes over a series of separator baffles, or regulating devices within the interceptor, that separates out the fats, oils, and grease which float to the top of the interceptor and accumulate until manually removed. The wastewater continues to flow through the interceptor, into a discharge pipe, and then to the City's sewer system.

Grease Interceptors Must Be Properly Sized

Sizing of grease interceptors shall comply with the criteria specified in Title 15 of the Rules of the City of New York §19-11, including applicable Tables I and/or II.

Grease Interceptors Must Conform to PDI G101, ASME A112.14.3 or ASME A112.14.4

These are standards published by the Plumbing and Drainage Institute (PDI) and the American Society of Mechanical Engineers (ASME).

Check for certification with such standards before purchasing the grease interceptor.

Grease Interceptor Maintenance

Grease interceptors shall be properly installed, maintained and operated, to insure that the requirements of this section and other applicable sections of the regulations are met. This shall include routine cleaning and grease removal from the interceptor, as needed to insure the proper operation of the interceptors.

Properly Disposal of Fats, Oils, and Grease

- Carters that pick up fats, oils, and grease may be found by various means. Also, a partial list can be found under "fat, grease, and bone renderers" at the following website: www.nyc.gov/html/nycwasteless/html/recycling/recyclers_vendors.shtml#renderers
- Our mention of this website does not constitute an endorsement of the services of any of the carters listed therein. If you find any outdated information, or would like to suggest additional listings, please send an email as suggested on the website.

Any carter that picks up fats, oils, and grease from your establishment must have a trade waste removal license from the City of New York Business Integrity Commission. You must ensure that the carter has such a license. You may do so by checking the list of licensed carters online at www.nyc.gov/html/bic/downloads/pdf/tw_licensed.pdf or by calling the Business Integrity Commission at 311.