

Backflow Prevention Guidelines for Filling and Rinsing Fertilizer or Pesticide Application Tanks

BACKFLOW PREVENTION DEVICES:

Minnesota Department of Agriculture (MDA) and Minnesota Department of Health (MDH) regulations require the use of a backflow prevention device or fixed air gap when filling fertilizer or pesticide application equipment from a municipal water supply, private well, or surface water. The backflow prevention device must comply with the Minnesota Department of Health (MDH) regulations, and the Minnesota Plumbing Code. Before installing any backflow prevention device, check with your local Department of Health for specifications. Requirements may vary for each municipality and each situation.

Listed below are four specific examples of backflow prevention systems that can be installed to prevent backflow when filling fertilizer or pesticide application equipment.

AIR GAP: A physical separation from the discharge outlet to the rim of the tank, container, etc.

Example: A firm uses a 3-inch water line to fill pesticide or fertilizer application equipment. The physical distance from the opening of the application equipment to the end of the water line must be two (2) times the diameter of the water line; or in this case, six (6) inches. The air gap distance must be maintained under all circumstances.

When filling application equipment, if an air gap cannot be maintained (fixed and permanent), then the firm must use an approved type of backflow device when filling application equipment. See example diagrams for specific application.

REDUCED PRESSURE PRINCIPLE DEVICE (RPP OR ALSO REFERRED TO AS RPZ): Two independent check valves with an automatic pressure differential valve located between the two valves. If either check valve leaks, the relief valve will discharge to the atmosphere. If located properly, this device could be used by itself for prevention of backflow when filling application equipment and/or rinsing/washing empty pesticide containers and application equipment.

When installing any RPP or RPZ, a firm must notify the MDH or the local administrative authority. The installation will be permitted only when a periodic testing and inspection program conducted by qualified personnel will be provided by an agency acceptable to the administrative authority. All installations should be done by a plumber certified by the MDH in backflow prevention, and who will comply with sections 4715.2000 - 4715.2280 of the Minnesota Plumbing Code. See example diagrams for specific application.

Pressurized Vacuum Breaker (PVB): Pressurized vacuum breakers must be installed utilizing good plumbing practices. The most common installation of a PVB would be at an elbow in a vertical position where it is readily accessible for periodic inspection and servicing. Due to the possibility of some spillage, do not locate these valves in concealed areas where spillage of water will cause damage.

If located properly, this device could be used by itself for prevention of backflow when filling application equipment and/or rinsing/washing empty pesticide containers and application equipment. Installation should be in a continuous pressure system, at a minimum of 12 inches above overflow level of the equipment being filled. A shutoff valve must be installed downstream of the PVB (on the outlet side). See example diagrams for specific application.

Atmospheric Vacuum Breaker (AVB): Atmospheric vacuum breakers must be installed utilizing good plumbing practices. This type of device can be used for protection when filling application equipment, but requires some additional device on faucets used for rinsing pesticide containers and application equipment. Installation should be a minimum of 6 inches above overflow level of the equipment being filled. This device also must be installed where it is readily accessible. This device should not be under continuous pressure. Installation must be downstream from the last shutoff valve (no shutoff valve should be installed downstream from AVB). Most common installation location for an AVB (when filling agrichemical application equipment) would be on the 90 degree angle of a boom type filling system. See example diagrams for specific application.

DEFINITIONS: **Backflow:** The backward flow of water or other liquids, mixtures or substances (including agricultural chemicals) into a water supply from any source or sources. **Backsiphonage:** A pressure drop

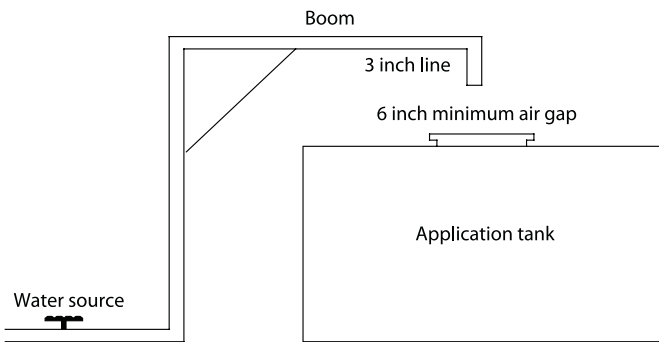
FIXED AIR GAP SYSTEM:

A fixed air gap system is only used for filling application equipment. This system utilizes a physical separation from the discharge outlet to rim of the tank or container. To achieve an acceptable air gap allow a space of two times the inside diameter of the water supply line.

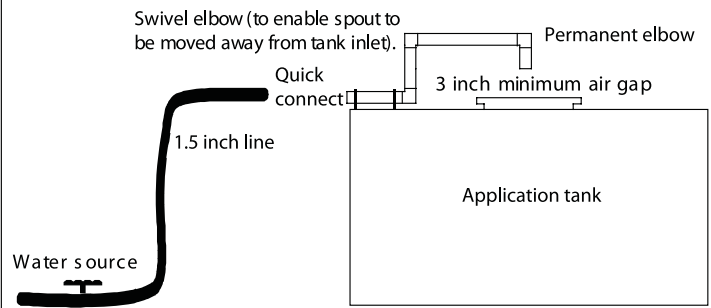
Example: for a 3 inch water supply line the minimum air gap which must be maintained would be 6 inches (2 X 3"). Air gap systems come in many shapes and sizes. Air gap systems can be constructed at a central filling location, or they can be constructed to be attached to the application tank being filled. An employee holding a hose above a tank while filling is not an adequate air gap since it is not fixed or permanent.

See examples 1(a), 1(b), 1(c) and 1(d).

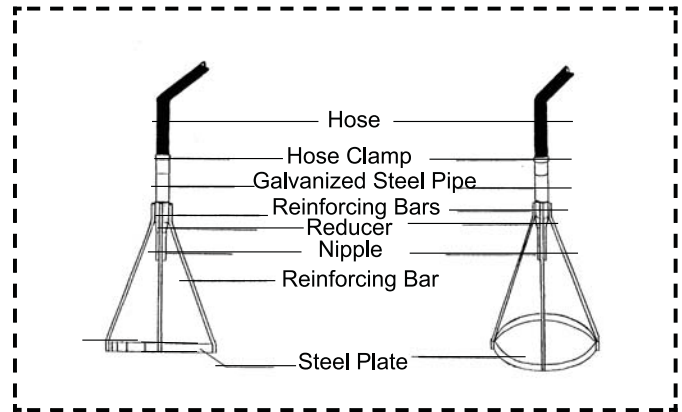
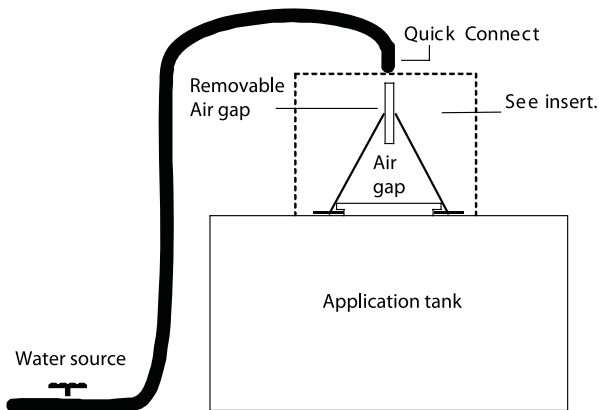
EXAMPLE 1(a)



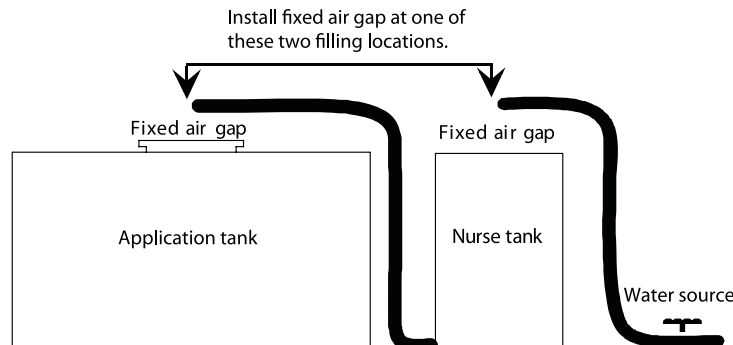
EXAMPLE 1(b)



EXAMPLE 1(c)



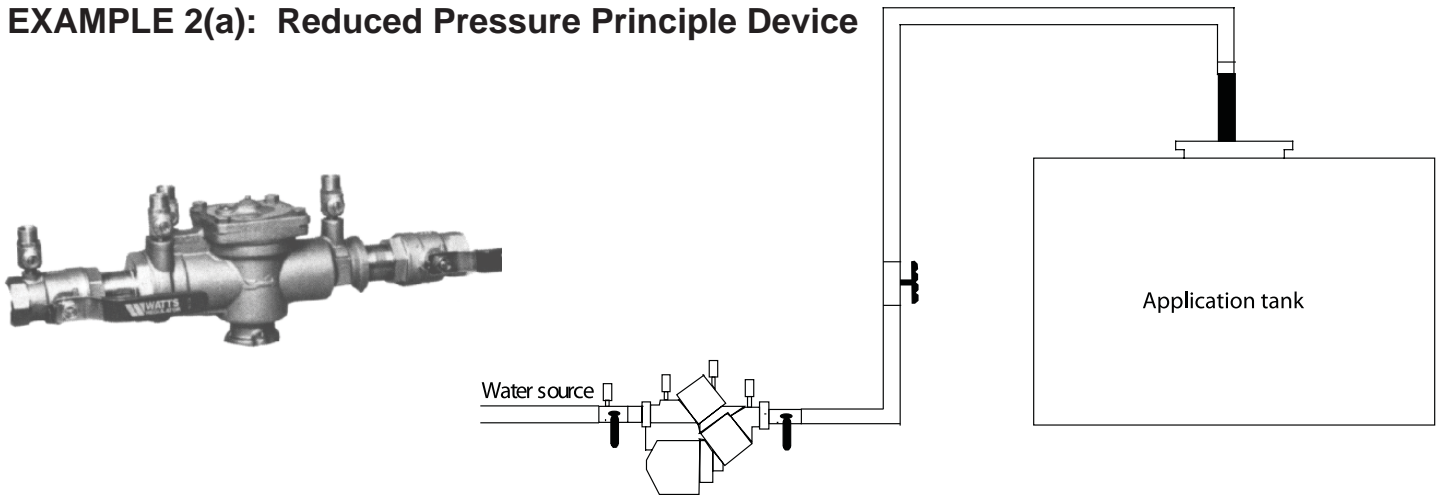
EXAMPLE 1(d)



BACKFLOW PREVENTION DEVICES: See examples 2(a), 2(b), and 2(c).

All installations should be done by a licensed plumber who will comply with the Minnesota Plumbing Code. Installation is only permitted when a periodic testing and inspection program is conducted by qualified personnel. A test and inspection tag must be affixed to the device.

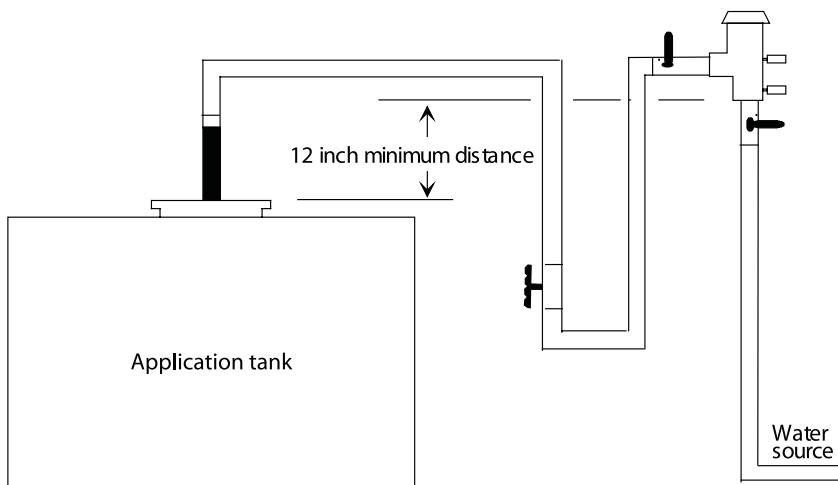
EXAMPLE 2(a): Reduced Pressure Principle Device



EXAMPLE of test and inspection tag affixed to the RPZ device.

<p style="text-align: center;">MINNESOTA MECHANICAL CONTRACTORS ASSOCIATION ST. PAUL PLUMBERS JOINT JOURNEYMAN TRAINING COMMITTEE</p> <p style="text-align: center;">4715.2161 INSTALLATION OF REDUCED PRESSURE BACKFLOW PREVENTERS</p> <p>Subpart 1. Notification of Installation. The administrative authority must be notified before installation of a reduced pressure backflow preventer.</p> <p>Subpart 2. Testing and maintenance. The installation of reduced pressure backflow preventers shall be permitted only when a periodic testing and inspection program conducted by qualified personnel will be provided by an agency acceptable to the administrative authority. Inspection intervals shall not exceed one year, and overhaul intervals shall not exceed five years. They shall be inspected frequently after initial installation to assure that they have been properly installed and that debris resulting from the piping installation has not interfered with the functioning of the device.</p> <p>Subpart 3. Inspection and records. A test and inspection tag must be affixed to the device. The tester shall date and sign the tag and include the tester's backflow preventer test identification number. Written records of testing and maintenance must be maintained and submitted to the administrative authority.</p> <p>STAT. AUTH: MS § 16b.61; 326.37 TO 326.45 HIST: 15 sr 76</p>	<p style="text-align: center;">MINNESOTA MECHANICAL CONTRACTORS ASSOCIATION ST. PAUL PLUMBERS JOINT JOURNEYMAN TRAINING COMMITTEE Reduced Pressure Zone Backflow Preventer - Accredited Testing By:</p> <p>Company Name _____ Phone Number _____</p> <p>Address _____ City/State/Zip _____</p> <p>Bldg. Address _____ Manuf _____</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 15%;">#1 CV psi/diff</th> <th style="width: 15%;">Relief psi/diff</th> <th style="width: 15%;">#2 CV</th> <th style="width: 20%;">Tester Name & Number</th> <th style="width: 20%;">Date</th> </tr> </thead> <tbody> <tr> <td>Installed</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1st Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2nd Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3rd Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4th Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		#1 CV psi/diff	Relief psi/diff	#2 CV	Tester Name & Number	Date	Installed						1st Year						2nd Year						3rd Year						4th Year					
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EXAMPLE 2(b): Pressurized Vacuum Breaker



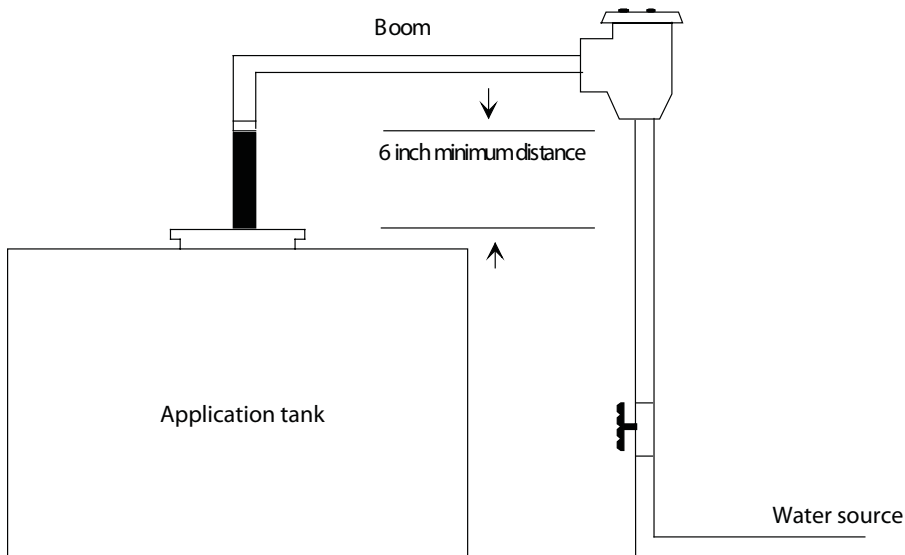
Installed 12 inches above overflow level of equipment being filled.

Installed in a continuous pressure system.

Shutoff valve needs to be installed downstream of PVB (on the outlet side).

Installation must be in a location where PVB is readily accessible.

EXAMPLE 2(c): Atmospheric Vacuum Breaker



Installed 6 inches above overflow level of equipment being filled.

Should not be subject to continuous pressure.

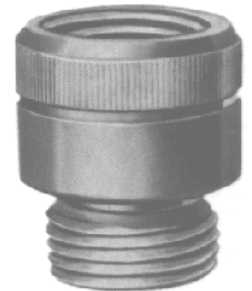
Installed downstream of the shutoff valve (no shutoff valve downstream from AVB).

Installation must be in a location where AVB is readily accessible.

FOR RINSING EMPTY PESTICIDE CONTAINERS

Firms that choose an air gap system or atmospheric vacuum breaker device for backflow prevention when filling agrichemical application equipment must provide at minimum a Hose Connection Vacuum Breaker on the faucet or Double Check Valve with Intermediate Atmospheric Vent on the line used for rinsing empty pesticide containers.

HOSE CONNECTION VACUUM BREAKER: Must be attached on the discharge side of the last control valve. Typically, this device is attached on the faucet of the last control valve. This will allow protection when rinsing empty pesticide containers and application equipment. Do not install a hose with a spray control valve following a hose connection vacuum breaker. If a hose with a spray control valve will be attached to a water supply faucet, the firm should use a Double Check Valve with Atmospheric Vent for their backflow prevention. For the hose connection vacuum breaker to work properly, no shutoff or control valve can be installed after



DOUBLE CHECK VALVE WITH INTERMEDIATE ATMOSPHERIC VENT:

For inline applications with continuous pressure. This type of device has very specific application and is not to be substituted for the RPP, PVB, AVB, or an air gap. By itself, this device is not approved for filling application equipment. A double check valve may be used on 1/2 and 3/4 inch water supplies used for the rinsing of empty pesticide/fertilizer containers and application equipment.



FOR FURTHER INFORMATION CONTACT:

Minnesota Dept. of Labor and Industry, 443 Lafayette Rd N, St. Paul, MN 55155, www.doli.state.mn.us/pe_contactus.html

Jim Peterson, Plumbing Program Supervisor - 651-284-5589

Please contact the plumbing inspector responsible for your part of the state.

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