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## Chemical Dispensers and Y-Valve Installations

The Arizona Department of Health Services requires that plumbing meet the 2012 International Plumbing Code requirements (2012 IPC) or local applicable requirements if they are more restrictive than the minimum requirements in the 2012 IPC. Plumbing regulations are enforced in order to prevent cross-connection hazards from occurring. All plumbing connections—including chemical dispensing systems that provide a means of mixing potable water with chemicals to provide a user with a ready-for-use chemical solution—shall be in compliance with current codes, manufacturer design specifications, and Department requirements.

Provide an approved, dedicated water supply line in the mop/service sink area to supply water when chemical dispensers are utilized. **See Figure 1.**

**Figure 1—Approved Connection**



Do not use a faucet equipped with an atmospheric vacuum breaker (AVB) to supply water to chemical dispensers in a potable water distribution system. An AVB located on a mop/service sink faucet is considered a non-testable backflow prevention device.

The AVB is not designed for use in high health hazard applications (e.g. soaps, sprays, degreasers, chemicals, and similar contaminants), and shall not be used where subjected to continuous pressure on the backflow prevention device. Y-Valves, shut-off valves,



devices or obstructions downstream (e.g. chemical dispenser, shut-off type spray nozzle, etc.) from faucet AVBs are not permitted, as this will result in continuous water pressure and failure of the backflow prevention device. It is considered a violation and requires corrective action.

All chemical dispensing systems shall be classified American Society of Sanitary Engineering (ASSE) standard 1055, either equipped with a visible full self-contained air gap fitting as a means of backflow protection, or provided with an approved testable continuous pressure backflow prevention assembly. **See Figure 2.**

**Figure 2—Continuous Pressure Vacuum Breaker**



The following plumbing connection scenarios are considered to be improperly installed (with or without hose-bib vacuum breakers attached) and are not in compliance:

- **A faucet equipped with an AVB with a water supply line directly feeding a chemical dispenser:**

ASSE 1001 performance requirements for AVB devices state that these backflow preventers are not designed for applications where they could be subjected to continuous water pressure, and are not testable for maintenance. Under such installations, the AVB devices will fail under constant pressure conditions, resulting in a potential cross-connection hazard. **See Figure 3.**

**Figure 3—Unapproved Connection**



- **A faucet equipped with an AVB and a Y-valve attached supplying water to a chemical dispenser:**

Installing a Y-valve, similar downstream shut-off device or obstruction, places back pressure on the AVB. Both sides of a Y-valve connected to a sink for a chemical dispenser are pressurized: one side supplying water to the chemical feeder, and the other side to the shut-off valve on the Y-valve, or to a hose attached. Since AVBs could be kept on under constant pressure at all times, they will fail under such installations. When the faucet is used with a hose on the open side of a Y-valve, there is now a potential cross-connection hazard. **See Figure 4.**

**Figure 4—Unapproved Connection**





- **A faucet equipped with an AVB and a Y-valve attached:**

Y-valves and similar downstream shut-off devices that have an integral shut-off valve (e.g. solenoid, butterfly valve, ball valve, spray nozzles etc.) connected to a faucet equipped with an integral AVB, including chemical dispensers, are not permitted on a faucet equipped with an AVB, due to the device's inability to be under constant pressure as this will result in failure of the backflow device. There is now a potential cross-connection hazard. **See Figure 5.**

**Figure 5—Unapproved Connection**



- **A faucet equipped with an AVB with a “sidekick” or similar downstream shutoff device or obstruction:**

Installing a “side-kick,” or a similar downstream shut-off device or obstruction, places back pressure on the AVB. Since the AVBs could be kept on under constant pressure at all times, they will fail under such installations. Chemical dispensers that are connected to a faucet with a “sidekick” pressure bleeding device on the faucet outlet—including devices referred to as a wasting tee, flow-through device, or otherwise known as a “sidekick” device—are considered obstructions and are not approved, as they are prone to fouling/plugging failures under typical water and operating conditions. There is now a potential cross-connection hazard. **See Figure 6.**



**Figure 6—Unapproved Connection**



- **A faucet equipped with an AVB, Y-valve attached, and a hose(s) is connected, or a faucet equipped with an AVB with an adjustable/shut-off type spray nozzle attached to a hose:**

If you wish to maintain a hose attached with a shut-off type spray nozzle under continuous pressure, an approved testable continuous pressure vacuum breaker is required. NOTE: Simply adding a hose-bib type vacuum breaker to a faucet under the aforementioned scenarios will not result in code compliance. **See Figure 7.**

**Figure 7—Unapproved Connection**





ADHS

All cross-connection hazards must be prevented, and all plumbing must be in compliance with Department requirements.

A good reference for determining the proper installation of backflow prevention devices and assemblies, and preventing cross-connections is the *Cross-Connection Control Manual*, which was published by the United State Environmental Protection Agency (EPA) in 2003. This manual is available for download if you “Search Publications” on the National Service Center for Environmental Publications (NSCEP). The NSCEP can be accessed at: [www.epa.gov/nscep](http://www.epa.gov/nscep).

For additional information, please contact the Arizona Department of Health Services’ Office of Environmental Health at 602-364-3118 or [EnvironmentalHealth@azdhs.gov](mailto:EnvironmentalHealth@azdhs.gov), or contact your local municipality’s cross-connection control specialist.