Choosing and Installing Trap Primers

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Many codes and authorities having jurisdiction require trap primers in lieu of deep-seal P-traps where floor drains are used infrequently. An example of such an area is a mechanical or service room that is prone to warm, dry temperatures, which cause water in the floor drain traps to rapidly evaporate. Trap seal evaporation creates a pathway for sewer gases to escape into the occupied space. This sewer gas may carry pathogens in aerosol form. Trap primers allow a constant water supply to the P-trap to prevent sewer gases from entering the space through the floor drain. When specifying trap primers, you should consider factors such as the trap primer type and installation and local code requirements. American Society of Sanitary Engineering Standard 1018-2001 covers trap primers.

**Trap Primer Types**

Several types of trap primers are on the market, including fixture supply-water type, pressure-differential-actuated valves, fixture wastewater type, and electric-operated solenoid valves.

Fixture supply-water type trap primers also are known as continuous flow trap primers (Figure 1). They typically are constructed of cast brass or bronze with a neoprene rubber poppet float that rises when water flows through the primer. When the poppet float rises, water flows through a water line into the floor drain trap. This primer type has no way to filter debris and often clogs where water flows continuously or not at all. The amount of water that is discharged into the trap depends on how much water flows through the device. Because of maintenance reasons, fixture supply-water type trap primers are not usually the trap primer of choice. However, it is my opinion that this trap primer type has less moving parts than most and is less likely to cause problems.

Pressure-differential-actuated valves, also known as pressure drop activated trap primers, typically are manufactured of brass (Figure 2). They are provided with ½-inch MIP inlet connections and ½-inch FIP outlet connections. When the water line pressure is in the static state, an interior cartridge seals, prohibiting water from passing through the primer. When the water pressure drops, such as when a toilet flushes or faucet runs, the interior cartridge rises, allowing water to flow under pressure to the floor drain trap. Pressure-differential-actuated trap primers have a fine brass mesh filter that screens debris to ensure that the cartridge does not clog and that water is delivered in a uniform manner. The filter must be easily accessible for cleaning or replacement, so consider its location carefully. You can install distribution units with pressure-differential-actuated primers to distribute water to as many as 10 floor drain traps that are located near one another. This reduces the number of primers used, which decreases cost and maintenance.

Fixture wastewater-type primers, sometimes called flush valve trap primers, are installed on the tailpiece of a water closet’s flush valve (Figure 3). This device directs an amount of water discharging from the flush valve to the piping connected to the floor drain. This type of primer is advantageous because the water used already is being consumed by the flush valve operation, which conserves water, and the primer does not have any moving parts. Some designers do not like flush valve trap primers because the flush valve must be located near the floor drain and, with the use of 1.5-gallons-per-minute flush valves, the drain may not get sufficient water to keep the trap sealed. But this is my trap primer type of choice in toilet rooms because there aren't any moving parts, and I disagree with the concern that 1.5-gpm flush valves do not allow enough water to the floor drain P-trap.

Electric-operated solenoid valves sometimes are known as automatic trap primers (Figure 4). These primers comprise a solenoid valve and a timer.
The timer can be set to open the solenoid valve to allow a certain amount of water to enter the trap. To operate and set the timer, you must locate an electric-operated solenoid valve primer in an accessible space. Above accessible ceilings or in mechanical rooms or janitor closets are good locations. The timer and solenoid valve require electricity, so make sure you coordinate the electrical requirements with the electrical engineer.

Remember, any connection between the sewer system and the potable water system requires protection from contamination. All the primers mentioned can be manufactured or fitted with devices that prevent cross-contamination. Many local codes require the use of an air gap fitting (Figure 5) underneath the trap primer. You can do this by providing a vertical space that is twice the diameter of the water supply connection, which will ensure positive protection against backflow. When an air gap is required by code, you should locate it in an area where splashing water from the air gap won’t damage the space.

**Installation Considerations**

You should install fixture supply-water type trap primers and pressure-differential-actuated valves at least 10 inches above floor drain traps. This ensures that the pressure drop is enough to discharge water to the traps. Connect a trap primer to the water supply line vertically with a raised elbow, so debris can’t enter the primer and cause it to malfunction. If the trap primer is not located above an accessible ceiling or exposed in a mechanical room or space, an access door should be specified. Trap primers have moving parts that eventually will need to be replaced, repaired, or cleaned. The access door should be large enough for hand access.

You should install shutoff valves directly before the primer for quick and easy repair. The shutoff valve will facilitate the primer’s cleaning and maintenance without shutting off the main water supply from the building. The primer installer should flush the water lines thoroughly before installation. Pipe dope or paste never should be used when installing a primer because the residue from these adhesives can enter the primer and cause clogging.

**References**