

# Selecting and installing PVC pipe

By Luke Frank

Irrigation piping is like underwear—as long as it's hidden and not leaking, you're not likely to give it much thought. But like skivvies, an irrigation piping system must match the demands of the system and the environment in which it performs, and when it fails to perform, it's pretty obvious.

For the sake of simplicity, we'll address sports turf irrigation piping systems comprised of PVC piping and fittings, the most common material used in turf applications. Two primary types of PVC are used, and differ only in the pressure rating system used to designate their respective capacities.

## PIPING PRESSURE RATING SYSTEMS

The PVC industry has developed two pressure-rating systems: the Standard Dimension Ratio (SDR) and the Schedule system. The SDR is a ratio of the minimum wall thickness to the outside diameter of the pipe for an established pressure level. This type of PVC pipe is commonly referred to as Class pipe. Therefore a system comprised of Class 200 PVC pipe has a pressure rating of 200 psi.

In the Schedule system, Schedule 40 and Schedule 80 PVC pipe have specific pressure ratings for each pipe size. These ratings can range from 850 psi for half-inch Schedule 80 pipe, down to about 180 psi for 6-inch Schedule 40 pipe.

The use of Class pipe in turf irrigation systems ensures a consistent pressure rating throughout the entire system. The Schedule system would have the same rating as the largest-diameter pipe, since the pressure rating decreases as the diameter increases.

## A fitting proposition

There are several choices of fittings used to connect PVC pipe and route the system main and laterals. We'll zero in on the four primary options: PVC fittings that are solvent welded to join pipe; PVC fittings that use ring-tight gasket connections; epoxy-coated steel fit-

tings that are joined to pipe with gasket joints; and ductile-iron, gasket-joint fittings.

Naturally, there are a near endless variety of specialty fittings that target the individual needs of sports turf managers and sites. And, there are numerous products that can make irrigation piping system repairs simpler.

Compression couplings using gaskets to effect a seal, and solvent-welded slip-fix type expanding couplings can transform a difficult repair into a relative cakewalk. But far and away the most popular type of fitting used in landscape irrigation systems is the solvent-welded PVC fitting. It's inexpensive and easy to install, and when properly used should provide years of trouble-free operation.



## When the pressure's on

Large turf irrigation systems consist of pressurized mainlines that feed water to a series of automatic control valves. The control valves are opened and closed either electrically or hydraulically and in turn feed water to the lateral lines and ultimately the sprinkler heads.

The opening and closing of valves can cause pressure surges in the system, known as water hammer, that if repeated often enough can damage fittings and cause a destructive and at times expensive piping system failure.

The power behind water hammer can be reduced by maintaining acceptable system velocities through proper system design and scheduling. So, if a system is properly designed, why do we still have fitting failures? The issue may lie with how the fittings are/were installed.

Perhaps the most common problem associated with sports turf irrigation piping system failures is the welding of solvent-cement joints. As straightforward as the process seems, a certain degree of attention and procedure is required to construct a leak-free, durable joint.

Before you ever get out into the field, it's critical that you select the proper solvent cements and primers. Don't confuse primers with plastic pipe cleaners, and most cement labels offer a range of pipe sizes for which the product will be most effective.



Solvent cement consists mostly of volatiles that evaporate during curing. When a solvent-cement is not evenly and appropriately applied and the parts aren't quickly joined, the volatiles "flash off," leaving insufficient solvent to create a bond between the pipe and fitting. This results in a dry joint.

Always adhere to the proper sequence of applying primer and cement recommended by the manufacturer. Generally, the recommended procedure is to prime both the pipe and fitting socket to be joined. Then, immediately apply a light coat of cement to the adjoining tapered socket pipe end and a more liberal coat of cement to the outside of the pipe. Push the parts together, rotating one-eighth to one-quarter turn and hold the joint for about 15 seconds.

The second coat of cement on the pipe is the key to success because it puts the most adhesive where it will be most beneficial. As you insert the pipe into the fitting, any excess cement on the pipe will be pushed out along the pipe, filling the gap between the pipe and the fitting at the socket opening. Excess cement will not be trapped inside the joints.

Finally, wipe off the connection, as excess cement and primer can cause softening and blistering of the plastic compounds. And rest easier with the knowledge that properly designed and installed irrigation piping and fittings should last upwards of 50 years.

Paying a little more attention to the less visible parts of your irrigation system will increase your comfort in how well and how long products perform. ■

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