

## AIR TESTING OF INSTALLED PVC PIPELINES

### GRAVITY SEWER PIPE

Air testing is often performed on sewer pipelines to ensure the integrity of installed materials and to verify that correct construction methods have been used. Prior to testing, all connections and service laterals should be plugged and adequately braced to resist test pressures.

The document most often specified for air testing is ASTM F1417 “Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air.” In sections 5.2 and 6.1.4, F1417 specifies an upper limit for test pressure by requiring a pressure regulator set to a maximum of 9 psig.

- **Safety Considerations**

Although 9 psi is considered low-pressure testing, there are still significant forces involved. For example, end plugs on a 24-inch ASTM F679 sewer pipe pressurized to 9 psi must be braced to resist an end thrust of about 3,900 pounds. If a plug were to let go, rapid expansion of compressed air could push it out of the pipe forcefully and create a rush of air – risking injury for anyone in the manhole structure. Safety dictates that personnel should not be in a manhole during pressure testing.

### PRESSURE PIPE

Water pipe is pressure tested for the same reasons as gravity pipe, but the pressures are much higher. Typically, project specifications allow test pressure to be as high as the pressure class of the pipe. Using 24-inch DR21 Pressure Class 200 AWWA C905 pipe as an example, the end thrust would be about 86,000 pounds (more than 20 times as high as the sewer-pipe force described above).

- **Test PVC Pressure Pipe With Water Only**

The compressible nature of air means that extremely high potential energy is stored in the pipe during high-pressure air testing. According to the *Handbook of PE Pipe*, any failure in the piping system would have dangerous consequences, since the energy released (compared to testing with water) would be much greater, more forceful, and of longer duration.

Even when water is used, it is important that all air be expelled from the pipeline during filling and again before pressure testing. Automatic air-release valves are recommended. See *Uni-Bell Technical Brief*, “Air Valves: A Cost-Effective Way to Enhance Pressure-Pipe Performance.”

- **Air-Pressure Testing of Installed PVC Pressure Pipe is Expressly Prohibited for Reasons of Safety**

Because it is sometimes difficult to obtain water due to site conditions, the question of air testing is sometimes raised. For safety reasons, the PVC Pipe Association is adamant that PVC pressure pipe be tested with water only and that **UNDER NO CIRCUMSTANCES SHOULD AIR TESTING BE PERFORMED ON PRESSURE PIPE**. See Uni-Bell’s *Handbook of PVC Pipe* and “Installation Guide for PVC Pressure Pipe.”

References: ASTM standards F679 and F1417; AWWA standard C905; *Handbook of PE Pipe*; *Handbook of PVC Pipe*; and “Air Valves: A Cost-Effective Way to Enhance Pressure-Pipe Performance,” *Uni-Bell Technical Brief*