

# Hydrostatic Pressure Testing

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## Dangers of Air Testing

### **WARNING**



**AIR OR COMPRESSED GAS MUST NEVER BE USED FOR PRESSURE TESTING! USE OF COMPRESSED AIR OR GAS IN PVC/CPVC PIPE AND FITTINGS CAN CAUSE EXPLOSIVE FAILURES RESULTING IN SYSTEM DAMAGE, SEVERE BODILY INJURY, OR DEATH!**

- **Compressed air or gases must never be used for testing of rigid PVC and CPVC piping systems.** Improper installation, especially poor workmanship in solvent cementing techniques, can lead to an abrupt release of tremendous stored energy in the presence of compressed air or gas. This abrupt release of energy creates a “whipping action” of the piping where shattering of pipe and fittings is then apt to occur at directional changes and at points where the system is rigidly restrained. **This scenario creates a substantial safety hazard to personnel!**
- Secondary hairline stress fractures caused by the “whipping” effect can also be initiated which will tend to propagate over time resulting in additional failures.
- **Certain additives present in air compressor lubricants are not chemically compatible with CPVC materials** and will initiate stress cracking of the plastic, further increasing the potential for additional failures.
- Failure to bleed the air from the system will create pockets of entrapped air within the piping network. **Entrapped air is the most predominant cause of excessive pressure surges in any system, regardless of piping material used.** Precautions must be taken to eliminate entrapped air from within the system. Filling lines slowly and bleeding air from the highest and furthest sprinkler heads can reduce the potential for damage during the filling process prior to pressure testing.
- PVC & CPVC piping products are “rigid” thermoplastic materials. As a result, Harvel Plastics, Inc. does not recommend the use of PVC or CPVC piping products for the testing, transport, or storage of compressed air or gases. The compressibility of air and/or other gases result in tremendous amounts of stored energy, even

at lower pressures. Should a failure occur in a compressed air or gas system for any reason (i.e. improper assembly, mechanical damage etc.) the failure mode will be very dramatic in nature due to the physical characteristics of the rigid piping in combination with the immediate release of this stored energy. Under these conditions, **the velocity created by rapidly escaping air and the resultant failure mode can throw shards of plastic in multiple directions (i.e. shrapnel/projectiles). This scenario creates a substantial hazard to personnel and property within the vicinity of the piping should a failure occur.**

Several cautionary statements and alerts against the use of rigid PVC/CPVC piping for use with compressed air or gases are available through the Plastic Pipe Institute (PPI), American Society for Testing and Materials (ASTM), various other trade organizations, manufacturers, safety codes, as well as several State and Federal Agencies (i.e. OSHA).

- **Compressed air or other gases must never be used in testing.** Extreme care should be used to assure complete venting of all entrapped air when filling the system with water or other liquids used in testing. Whether a hydraulic hand pump or available water line pressure is used, any slow build-up of gauge pressure on a completely liquid filled line shows some entrapped air in the system. Pressure should be immediately released and the line re-bled. Failure to do this can lead to a catastrophic failure when the decompressing gas suddenly accelerates the solid water column if a faulty joint separates.

Once an installation is completed and allowed to **cure** properly, **THE SYSTEM MUST BE PRESSURE TESTED WITH WATER** at 200 psi for 2 hours, or at 50 psi in excess of the maximum pressure, when the maximum pressure to be maintained in the system is in excess of 150 psi, in accordance with the requirements established by NFPA.

If a leak is found the pressure must be relieved, the failed section cut out, replaced, and allowed to cure properly prior to recharging and retesting the system.

When pressure testing, the sprinkler system shall be slowly filled with **water**, and the **air bled from the highest and farthest sprinkler heads before test pressure is applied.** Air must be removed from piping systems (plastic or metal) to prevent it from being locked in the system when pressure is applied. Entrapped air can generate excessive surge pressures that are potentially damaging, regardless of the piping materials used.