

## The Hartford Advises Fire Sprinkler Contractors to Follow Recommended Practices for Installation of Chlorinated Polyvinyl Chloride (CPVC) Sprinkler Pipe and Fittings

In the past five years, The Hartford has noted an increase in severe water damage claims from fire sprinkler contractors. Some water damage incidents have been attributed to problems with installation of chlorinated polyvinyl chloride (CPVC) piping and fittings in wet sprinkler systems. CPVC pipe and fittings are secured with special solvent cements. The piping manufacturer provides specific, minimum guidelines for curing times for these solvent cements. Curing times vary depending on the size of the pipe, temperature and humidity, and tightness of fit. A system should be tested and charged only after curing is complete; premature charging may cause fittings to fail and leak substantial amounts of water. The following claim history illustrates one such incident.

A fire sprinkler contractor was hired to install a wet sprinkler system in a refurbished four-story building in a historic district. Many of the original features of the building had been restored, including wide-plank wood floors and elaborate wood moldings. The building, which had been converted from residential to office use, was fully occupied during the retrofit. The type of sprinkler system chosen for this work used chlorinated polyvinyl chloride (CPVC) piping and fittings.

On the last day of the retrofit project, the final CPVC piping was installed, and the fittings secured. The cure time period recommended for this particular installation was five hours. The work took longer than had been anticipated, and a single employee was left at the premises to finish up and charge the system. As it was approaching his dinner hour, the employee decided to charge the system after it had cured for only *three* hours. He informed the security guard on duty in the lobby that the system had been charged, then left the premises. Within twenty minutes, a fitting on the fourth floor had opened up. The water flowed freely from the fourth floor to the first floor; in many places it poured through the wood floor planking and pooled between the floor and the ceiling downstairs. Because the security guard didn't know where the shutoff valve was located, he had to call the Fire Department for assistance.

The damage to the building and the contents of the tenants was valued at approximately \$175,000. This loss could have been prevented if the manufacturer's recommendations for curing times had been followed.

To minimize similar losses, The Hartford's Loss Control Department offers these general recommendations for installation of chlorinated polyvinyl chloride (CPVC) piping and fittings. Consult manufacturer's guidelines for complete instructions and specifications, including appropriate curing times.

### ***Administrative***

- ❑ Obtain appropriate CPVC installation certificate and renew training and certification every two years.
- ❑ Install CPVC in wet sprinkler systems only. Do not install CPVC in dry sprinkler systems.

### ***Installation Guidelines***

- ❑ Read the manufacturer's installation instructions carefully, and follow proper handling procedures.
- ❑ Keep CPVC pipe and fittings in original packaging until needed. If pipe and fittings must be stored outdoors, cover them with an opaque tarp.
- ❑ Use only CPVC pipe that has been stored and maintained properly. Do not use CPVC pipe that has been stored outdoors unless it has been covered properly, and do not use pipe that has faded in color.
- ❑ Use tools specifically designed for use with plastic pipe and fittings.
- ❑ Use drop cloths to protect interior finishes.

### ***Joining Pipe, Fittings, and Sprinklers***

- ❑ When installing CPVC piping in cold weather, be sure to allow for movement caused by normal expansion and contraction.
- ❑ Support sprinkler heads properly to prevent them from lifting through the ceiling when they are activated.
- ❑ Use Teflon® tape on sprinkler head threads and on all other threaded connections.
- ❑ Keep threaded rod within 1/16" of the pipe, or use a surge arrestor, but do not allow threaded rod to come in contact with the pipe.
- ❑ Cut the pipe ends square using a mitre box. Deburr and bevel the pipe end with a chamfering tool.
- ❑ Rotate the pipe one-quarter turn when bottoming pipe in fitting socket.
- ❑ Do not connect rigid metal couplers to CPVC grooved adapters.
- ❑ Do not thread, groove, or drill CPVC pipe.

### ***Use Solvents, Lubricants, and Anti-Freeze Solutions Properly***

- ❑ Use only thread sealants, gasket lubricants, and fire stop materials that are compatible with CPVC. Do not use petroleum or solvent-based sealant, lubricants or fire stop materials.
- ❑ Use proper solvent cement, and follow application instructions carefully.
- ❑ Use only fresh solvent cement. Do not use solvent cement that has exceeded its shelf life or that has become discolored or jellied.
- ❑ Apply solvent cement carefully. Prevent puddling or running of solvent cement in fittings and pipe, since accumulations will plug sprinkler head orifices.
- ❑ Avoid using solvent cement near sources of heat; do not smoke near solvent cements.
- ❑ Use only appropriate gasket lubricants. Do not use edible oils (such as Crisco®) as a gasket lubricant.
- ❑ Use only glycerin and water solutions for freeze protection. Do not use any glycol-based solutions as an anti-freeze.
- ❑ Mix glycerin and water solution in clean containers.

### ***Before Pressure Testing***

- ❑ Follow the manufacturer's recommended cure times prior to pressure testing. *Do not pressure test the system until minimum recommended cure times are met.*
- ❑ Conduct blowback testing to verify that the sprinkler system piping has no *significant* openings.
- ❑ Bleed the air from the system prior to pressure testing, and fill the lines slowly with water.