

## Residential Sprinkler Piping in Cold Space

Water is a very efficient firefighting agent. It's cheap, there's plenty of it, and it effectively fights fire by cooling fuels below their ignition temperature. One of the major disadvantages of water, however, is that it freezes at a relatively warm temperature. When installing fire sprinklers in a building, contractors as much as



possible try to keep the sprinkler pipe in "warm space". Unfortunately, with residential sprinklers, it is sometimes necessary to run pipe in the attic. When sprinkler pipe is run in an attic, certain precautions must be taken.

As much as possible, the sprinkler contractor should try to run pipe in a single stud or joist space. This will make the job of insulating the pipe much easier.

Pipe run horizontally should be covered by two layers of insulation. The first layer is placed over the pipe parallel to the run of the pipe. A second layer is laid over the first perpendicular to the pipe. Criss-crossing insulation will help insure that there are no air gaps. Since R-19 is a popular insulation factor, a general rule of thumb is sprinkler piping in cold space shall be insulated to R-38.

There should be no insulation between the sprinkler pipe and the ceiling drywall. We are relying on the heat radiating off of the drywall to keep the pipe warm. We do not want to block this heat transfer with insulation. Similarly, wrapping the pipe with insulation is not effective. Wrapping pipe may be effective for plumbing, but unlike the water in your plumbing system, the water in your sprinkler piping doesn't move. One side of the pipe needs to be exposed to a warm surface.



Vertical piping presents another challenge. Less heat is radiated from a wall than a ceiling. It is also much more difficult to attach insulation to a vertical surface. Sprinkler piping running in a stud space must be boxed in with plywood or other suitable sheeting. The box should be sealed to prevent airflow into the box. It is also a good idea to install louvered vents in the room to help move warm air into the box. Sealing the box will prevent the warm air from escaping into the attic. Insulation is then packed into the box as much as possible—behind and to the sides of the pipe. The box itself should then be insulated to a value of R-38.

Another useful measure is to route attic HVAC ducts in proximity to the sprinkler pipes. Also, if a second furnace is located in the attic, it will tend to keep the attic somewhat warmer.



As part of their winter maintenance program, homeowners should check their insulation and make sure they can't see any orange sprinkler pipe. Homeowners must not shut off their heat in the wintertime. Flowing water from the inspector's test connection, like letting water drip from a faucet, is not an effective means to prevent freezing since the sprinkler system is not looped.

Residential sprinkler systems are widely recognized as the most effective way of protecting your family from the dangers of fire. While freezing is an issue, it can be resolved through proper installation techniques and occasional maintenance.

If there are any questions concerning residential sprinklers, please call the fire prevention bureau at 847-318-5312.

