

## Construction Services Corner Construction Services Corner

## New Requirements for CSST Installation

The 2009 edition of the National Fire Protection Association (NFPA) 54 and the 2009 National Fuel Gas Code from the International Code Council (ICC) includes new requirements for bonding corrugated stainless steel tubing (CSST) gas piping systems to the grounding conductor of the building's electrical system. This response is due to the increase in fires caused by lightning strikes and the vulnerability of existing CSST to arc between metallic objects and create damage to the piping and a possible pin-hole leak in the tubing. The leak may catch fire and the flame may have the potential to burn any building materials in close vicinity. These new requirements will help reduce the possibility of damage from lightning strikes by reducing the electrical potential between metallic objects and building systems, including gas distribution.

**"7.13.2 CSST**. CSST gas piping systems shall be bonded to the electrical service grounding electrode system at the point where the gas service enters the building. The bonding jumper shall not be smaller than 6 AWG copper wire or equivalent."

"7.13.3 Prohibited Use. Gas piping shall not be used as a grounding conductor or electrode. This does not preclude the bonding of metallic piping to a grounding system."

**"7.13.4\* Lightning Protection Systems.** Where a lightning protection system is installed, the bonding of the gas piping shall be in accordance with NFPA 780, *Standard for the Installation of Lightning Protection Systems.*"

Bonding a CSST gas distribution system requires cooperation between the installer of the system, the electrician, and the installer of the lightning protection system if the building has one.

Instructions and other literature from CSST manufacturers now include these bonding requirements from NFPA 54. Several manufacturers also recommend the upgrading of existing CSST systems to include the required bonding.

Approved methods of bonding require the installation of a UL-listed ground clamp:

- on the black steel gas pipe where it enters the building; or
- on the manifold connecting the black steel gas pipe to multiple runs of CSST; or
- on the brass fitting connecting each run of CSST to a manifold.

The bonding conductor must be 6-gauge or larger copper wire, solid or stranded, and must be connected to the terminal on the UL-listed ground clamp. The bonding conductor must be continuous, with the other end connected to

- the steel enclosure of the electrical service equipment; or
- the grounded conductor at the electrical service; or
- the grounding electrode conductor (if it is large enough) between the service equipment and the grounding electrode(s); or
- one or more of the grounding electrodes for the electrical system.

The CSST must be bonded only at the end nearest the entry of the gas service into the building. If it is bonded at both ends, or at the end nearest the gas-burning appliance, the CSST may carry stray electrical currents or act as a grounding conductor, which can damage the CSST and its fittings, and cause leaks.

Installation methods of CSST should also be reviewed to make sure they are compliant with the manufacturer's installation instructions. Items to review are:

- The CSST should be "physically" separated from any other metallic materials or objects within the building. The tubing should also be "physically" separated from electrical cables or wires. There is not a specific measurement listed for this physical separation.
- If the tubing enters your gas fireplace, it must be physically separated from touching the metallic enclosure of the fireplace. If the fireplace venting goes out through the roof, the vent pipe should also be bonded as describes above for bonding the CSST piping.
- The CSST should not be kinked or bent to a radius (in most cases) smaller than 3".
- If a manifold is utilized for branching CSST to other appliances, it should be rigidly mounted.
- The CSST should not be directly connected to a moveable appliance like a stove, grill, dryer, etc.
- It's not recommended to use CSST on the exterior of a building for any situation.
- CSST should be supported adequately when ran horizontally. Typically supports should be every 6'.
- CSST should not be installed through ductwork. CSST can be routed through a masonry wall if properly sleeved with conduit with a ½" larger diameter than the CSST. The gap between the masonry, conduit, and CSST shall be sealed.

Following these codes and safety requirements will help prevent a fire due to CSST and lightning strikes. If you think your CSST installed in your dwelling or business is outside the requirements listed above, it's recommended you call a licensed heating and cooling contractor and electrician to fix the work. For more information please call the Community Development Department and ask to speak with the building inspector.