What is CSST gas piping & How is it identified in buildings?

CSST or Corrugated Stainless Steel Tubing is a flexible gas piping system that has been in use in the U.S. since 1990. In Japan the system has a decade more experience. "Standard Yellow CSST" such as shown below (adapted from csstafety.com) may appear in homes where gas piping was installed or modified since 1990. Through the web site csstsafe.com the National Association of State Fire Marshals and the CSST industry recommend that homes where gas piping has been installed or modified since 1990 be inspected for the presence of yellow CSST and that the electrical ground bonding in those homes be inspected.

Newer black or dark-jacketed CSST gas piping (shown below, adapted from GasTite's FlashShield CSST sales literature) currently sold by most manufacturers may not require special bonding from the manufacturer but still must be bonded under 2015 MSBC.

Watch out: Let's avoid a point of confusion: CSST used as gas piping runs in buildings is not the same product as the flexible gas connector tubing (shown below) used to actually connect gas appliances to the gas supply system, and different installation and product protection measures are required. CSST gas piping is used to route natural gas or LP gas supply through a building while the flexible gas tubing shown below is specifically designed for the connection of gas appliances to the gas piping system.

The gas appliance connector may be connected directly between the end of the CSST and the
appliance, or the CSST may terminate or be mixed with black iron gas piping in the same building. CSST gas piping is run both in exposed locations and through building cavities such as walls, ceilings or floors.

2015 Minnesota State Building Code Chapter 1346 Minnesota Mechanical and Fuel Gas Code

This portion of the Minnesota State Building Code includes the requirements for the installation of an electrical bonding system when CSST is incorporated into the gas piping system of residential or commercial construction.

The following code excerpt outlines the construction materials and installations that are required for a code compliant CSST installation that is bonded.

1346 Section 310 (IFGS) Electrical Bonding

310.1 Pipe and tubing other than CSST. Each above-ground portion of a gas piping system other than corrugated stainless steel tubing (CSST) that is likely to become energized shall be electrically continuous and bonded to an effective ground-fault current path. Gas piping other than CSST shall be considered to be bonded where it is connected to the appliances that are connected to the equipment grounding conductor of the circuit supplying that appliance.

310.1 CSST. Corrugated stainless steel tubing (CSST) gas piping systems shall be bonded to the electrical service grounding electrode system. The bonding jumper shall connect to a metallic pipe or fitting between the point of delivery and the first downstream CSST fitting. The bonding jumper shall be not smaller than 6 AWG copper wire or equivalent. Gas piping systems that contain one or more segments of CSST shall be bonded in accordance with this section.

What are the proper locations for the 6 AWG bonding wire clamp?

See applications A to E Attached.
APPLICATION A

BLACK METAL PIPE

GAS METER

END OF GAS SERVICE DELIVERY

BUILDING ENVELOPE

APPLIANCE - DIRECT HOOKUP OF HARD PIPE OR APPLIANCE CONNECTOR

NO CSST SO NO BONDING REQUIRED

APPLICATION E

BLACK METAL PIPE

GAS METER

END OF GAS SERVICE DELIVERY

MANUFACTURED HOUSING GAS CONNECTOR

BUILDING ENVELOPE

CSST TO APPLIANCE

* CORRECT CLAMP LOCATION FOR CSST BONDING TO ELECTRICAL SERVICE GROUNDING ELECTRODE SYSTEM