CSST: The question is not whether it should be bonded or not. 
The question is: Is the gas line properly installed? 
Inspection of the CSST

Gas Line: CSST: Sharp Bend: CSST Bend radius specifications: 
Carefully check pipe condition at fittings. Bent or twisted sections are defective.

<table>
<thead>
<tr>
<th>TUBING SIZE</th>
<th>ABSOLUTE MINIMUM BEND RADIUS (R)</th>
<th>RECOMMENDED MINIMUM BEND RADIUS (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8 inch</td>
<td>3/16 inch</td>
<td>3 inch</td>
</tr>
<tr>
<td>1/2 inch</td>
<td>3/4 inch</td>
<td>3 inch</td>
</tr>
<tr>
<td>3/4 inch</td>
<td>1 inch</td>
<td>3 inch</td>
</tr>
<tr>
<td>1 inch</td>
<td>3 inch</td>
<td>5 inch</td>
</tr>
<tr>
<td>1-1/4 inch</td>
<td>3 inch</td>
<td>5 inch</td>
</tr>
<tr>
<td>1-1/2 inch</td>
<td>3 inch</td>
<td>5 inch</td>
</tr>
<tr>
<td>2 inch</td>
<td>4 inch</td>
<td>6 inch</td>
</tr>
</tbody>
</table>

REPORT: REPORT: This home has corrugated stainless steel gas lines. This gas line has specific installation requirements related to required bending allowances, support, protection, and electrical bonding to ensure safe conditions. A section of the CSST gas line located XXXX is installed with a sharp radius bend that is not typical for this pipe size. Improper installation could result in leaking and hazardous conditions. A plumbing or HVAC contractor should be consulted for a complete evaluation of the CSST installation and to verify the presence of electrical bonding.

Gas Line: CSST: Support Space: CSST gas lines should be supported every required every 4ft (1/2”dia) 6 ft (3/4”) to 8( 1”) feet horizontal and 10 feet vertical.

<table>
<thead>
<tr>
<th>PIPING SIZE</th>
<th>SPACING OF SUPPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8 inch</td>
<td>4 FEET</td>
</tr>
<tr>
<td>1/2 inch</td>
<td>6 FEET</td>
</tr>
<tr>
<td>3/4 inch</td>
<td>8 FT. (USA) 6 FT. (CANADA)</td>
</tr>
<tr>
<td>1 inch</td>
<td>8 FT. (USA) 6 FT. (CANADA)</td>
</tr>
<tr>
<td>1-1/4 inch</td>
<td>8 FT. (USA) 6 FT. (CANADA)</td>
</tr>
<tr>
<td>1-1/2 inch</td>
<td>8 FT. (USA) 6 FT. (CANADA)</td>
</tr>
<tr>
<td>2 inch</td>
<td>8 FT. (USA) 6 FT. (CANADA)</td>
</tr>
</tbody>
</table>
REPORT:
Gas Line: CSST: Not Supported: This home has corrugated stainless steel gas lines. This gas line has specific installation requirements related to required bending allowances, support, protection, and electrical bonding to ensure safe conditions. A section of the CSST gas line located XXXX is installed without proper line support. Improper installation could result in leaking and hazardous conditions. A plumbing or HVAC contractor should be consulted for a complete evaluation of the CSST installation and to verify the presence of electrical bonding.

Gas Line: CSST: Concrete contact not allowed:
REPORT: This home has corrugated stainless steel gas lines. This gas line has specific installation requirements related to required bending allowances, support, protection, and electrical bonding to ensure safe conditions. A section of the CSST gas line located XXXX is installed with direct concrete contact which can result in corrosion. Improper installation could result in leaking and hazardous conditions. A plumbing or HVAC contractor should be consulted for a complete evaluation of the CSST installation and to verify the presence of electrical bonding.

Gas Line: CSST: pipe dope use is not allowed:
REPORT: This home has corrugated stainless steel gas lines. This gas line has specific installation requirements related to required bending allowances, support, protection, and electrical bonding to ensure safe conditions. Sections of the CSST gas line located XXXX are joined with the use of pipe dope which can result in corrosion. Improper installation could result in leaking and hazardous conditions. A plumbing or HVAC contractor should be consulted for a complete evaluation of the CSST installation and to verify the presence of electrical bonding.

Gas Line: CSST: Exterior Sections must have all stainless steel areas covered.
REPORT: This home has corrugated stainless steel gas lines. This gas line has specific installation requirements related to required bending allowances, support, protection, and electrical bonding to ensure safe conditions. An exterior section of the CSST gas line located XXXX has a section of exposed stainless steel. All exposed metal sections of the gas line should be protected or covered with a silicone self-bonding tape. Improper installation could result in leaking and hazardous conditions. A plumbing or HVAC contractor should be consulted for a complete evaluation of the CSST installation and to verify the presence of electrical bonding.

Gas Line: CSST: Crawl Space: Sections must have all stainless steel areas covered.
REPORT: This home has corrugated stainless steel gas lines. This gas line has specific installation requirements related to required bending allowances, support, protection, and electrical bonding to ensure safe conditions. A section of the CSST gas line located XXXXX in the crawl space has a section of exposed stainless steel. All exposed metal sections of the gas line should be protected or covered with a silicone self-bonding tape. Improper installation could result in leaking and hazardous conditions.
plumbing or HVAC contractor should be consulted for a complete evaluation of the CSST installation and to verify the presence of electrical bonding.

**Gas Line: CSST: Damage:** Most common damage is from improper tool usage, look for crimps and tool marks.

**REPORT:** This home has corrugated stainless steel gas lines. This gas line has specific installation requirements related to required bending allowances, support, protection, and electrical bonding to ensure safe conditions. A section of the CSST gas line located XXXXXX in the crawl space is damaged. Damaged gas lines could result in leaking and hazardous conditions. A plumbing or HVAC contractor should be consulted for a complete evaluation of the CSST installation and to verify the presence of electrical bonding.
Exposed Stainless Steel, sharp bend at fitting, corroded fitting.

Tubing must be installed in pipe where it enters masonry.

This is an appliance connector. Gray, Stainless or yellow, the appliance connector is not considered as CSST, but appliance connectors.

Approved bonding: Wrong Clamp: Typically zinc coated fitting is not rated for exterior usage.
BONDING

The 2009 edition of NFPA 54, *National Fuel Gas Code*, includes new requirements for bonding CSST gas piping systems to the grounding conductor of the building's electrical system, to reduce the possibility of damage by 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.

Specifications:

- Attach clamp down stream of gas meter at nearest point indoors or outdoors.
- Location must be between gas meter and first CSST fitting
- Attach UL 467 listed clamp to black iron pipe, hard piped manifold or sub-out
- If there is no black pipe then attach to the first CSST fitting using: Erico clamp # CWP1J, CWP2J or CSP3J, this is a brass fitting with stainless steel screw.
- Use a 6 awg copper bonding wire from the clamp to the:
  - Grounding Electrode or
  - Grounding Electrode Conductor or
  - Grounding Conductor terminal bar in the service panel or
  - Electrical Service Equipment Enclosure
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, 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
- The grounding electrodes ("ground rods") 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. The ground clamp must be connected to the brass fittings or steel line and never to the stainless steel line.

**Correct:** Zinc Plated UL467 clamp can be used for steel pipe connection in interior areas.

**Incorrect:** Only UL467 brass with stainless screws can be used for brass pipe fittings.