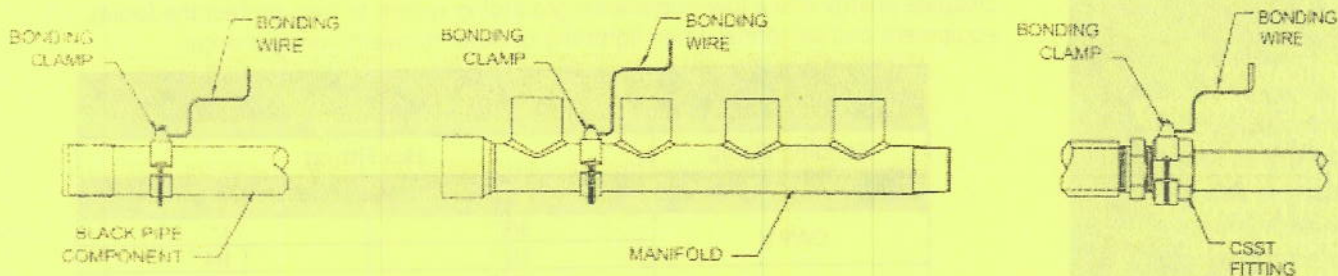


## Corrugated Stainless Steel Tubing (CSST) Bonding

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

- Attach clamp down stream of gas meter at nearest point indoors or outdoors
- Location must be between Gas Meter and First CSST fitting
- Attach UL467 listed clamp to Black Iron Pipe, Hard Piped Manifold, or Sub-Out
- If there is no Black Iron Pipe then attach to the first CSST fitting using:  
Erico clamp #CWP1J, CWP2J,CWP3J



- Use a 6 AWG copper bonding wire from the clamp to the:
  - Grounding Electrode or
  - Grounding Electrode Conductor (Min. 6 AWG copper) or
  - Grounded Conductor terminal bar in the service panel or
  - Electrical Service Equipment Enclosure
- Do not bury connections in the walls or floors.
- Do not attach clamps directly to CSST tubing.
- Do not attach to an independent or non-bonded ground rod.
- Avoid contact or parallel runs of CSST with metal components such as conduits, recessed lights, ductwork, or furnace/fireplace/appliance flues.

# ERITECH®

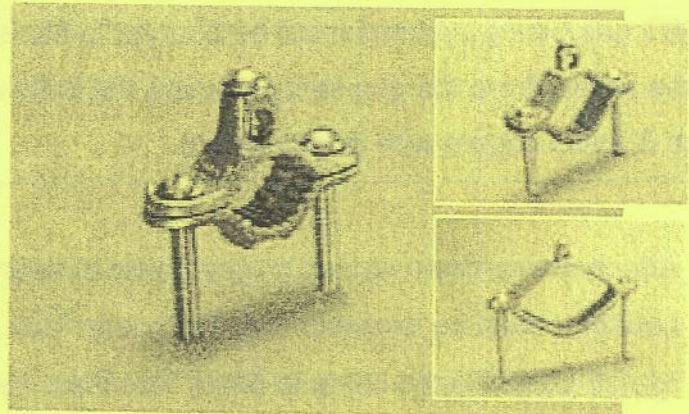
## Features

- Ideal for connecting copper conductors to metallic water pipe (including copper tubing) or ground rods
- Bond corrugated stainless steel tubing (CSST) or flexible gas pipe systems to the electrical system in accordance with the National Fuel Gas Code (NFGC) and the National Electrical Code® (NEC)
- Applications include lightning protection, fault current ground, signal reference grid and static ground
- CWP series of clamps fits hex fittings, copper grounding conductors, galvanized water pipes, copper water tubing or copper ground rods ranging from 1/2" to 4"
- High-strength silicone bronze clamps connect brass hex fittings
- UL® Listed (ANSI®/UL 467 - Category KDER)



# Pipe Clamps

For Water or Flexible Gas Pipes

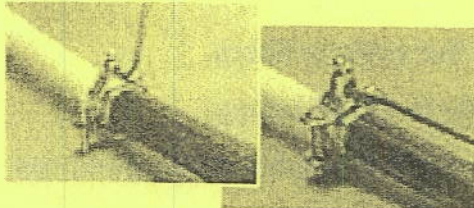


The UL® Listed CWP Grounding Clamp from ERICO® connects brass hex fittings, copper grounding conductors, galvanized water pipes, copper water tubing or ground rods to a ground conductor to bond all ground points together, eliminating ground loops and creating an equipotential plane. Part of the ERITECH® line of dissipation energy into a low-impedance grounding system to help protect the facility, equipment and personnel when lightning or other transient voltages occur.

Flexible Gas Pipe Brass Hex Fitting to Bonding Sizing		
Bonding Clamp	Hex Fitting	
Part Number	Nominal Pipe Size	Hex Nut Size
CWP1J	3/8"	1"
	1/2"	1 1/4"
CWP2J	3/4"	1 1/2"
	1"	1 7/8"
	1 1/4"	2 1/8"
CWP3J	1 1/2"	2 1/2"
	2"	3 1/8"

Part Number	Pipe Size	Conductor Size	Hex Nut Size (in) [Min]	Hex Nut Size (in) [Max]
CWP1J	1/2 in - 1 in	10 Sol - 2 Sol	1 in	1 1/4 in
CWP2J	1 1/4 in - 2 in	10 Sol - 2 Str	1 1/2 in	2 1/8 in
CWP3J	2 1/2 in - 4 in	10 Sol - 4 Str	2 1/2 in	3 1/8 in

**Material:** Bronze



### WARNING

ERICO products shall be installed and used only as indicated in ERICO's product instruction sheets and training materials. Instruction sheets are available at [www.erico.com](http://www.erico.com) and from your ERICO customer service representative. Improper installation, misuse, misapplication or other failure to completely follow ERICO's instructions and warnings may cause product malfunction, property damage, serious bodily injury and death.

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NEC is a registered trademark of, and National Electrical Code (NEC) standard is a copyright of the National Fire Protection Association. UL is a registered trademark of Underwriters Laboratories, Inc.

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## Technical Bulletin #TB2010-01

### Electrical Bonding of Gastite® CSST

June 3, 2010

This Technical Bulletin provides requirements for the direct bonding of Gastite® CSST. These requirements supersede any prior documents and are mandatory manufacturer's instructions until such time as requirements are adopted by the appropriate national/state model codes and direct bonding installation instructions are specified therein. This document replaces Technical Bulletin TB2008-01 and Section 4.10 Electrical Bonding/Grounding of the November 2008 Gastite Design & Installation Guide. This Technical Bulletin is effective for all Gastite CSST installed from this date forward.

Direct bonding of Gastite® CSST is required for all gas-piping systems incorporating Gastite® CSST whether or not the connected gas equipment is electrically powered. This requirement is provided as part of the manufacturer's instruction for single-family and multi-family buildings. A person knowledgeable in electrical system design, the local electrical code and these requirements should specify the bonding for commercial applications.

Gastite® CSST installed inside or attached to a building or structure shall be electrically continuous and direct bonded to the electrical ground system of the premise in which it is installed. The gas piping system shall be considered to be direct bonded when installed in accordance with the following:

The piping is permanently and directly connected to the electrical service equipment enclosure, the grounded conductor at the electrical service, the grounding electrode conductor (where of sufficient size) or to one or more of the grounding electrodes used. For single and multi-family structures, a **single bond connection** shall be made downstream of the individual gas meter for each housing unit and upstream of any CSST connection. The bonding conductor shall be no smaller than a 6 AWG copper wire or equivalent. The bonding jumper shall be attached in an approved manner in accordance with NEC Article 250.70 and the point of attachment for the bonding jumper shall be accessible. Bonding/grounding clamps shall be installed in accordance with its listing per UL 467 and shall make metal-to-metal contact with the piping. This bond is in addition to any other bonding requirements as specified by local codes.

*For attachment to the CSST gas piping system, a single bonding clamp must be attached to either a segment of steel pipe, a rigid pipe component or to the Gastite brass hex fitting. For attachment to a segment of steel pipe or a rigid pipe component any bonding clamp listed to UL467 may be used. For attachment to a Gastite hex fitting clamps manufactured by Erico (part number CWP1J for 3/8" & 1/2", CWP2J for 3/4" thru 1 1/4" and CWP3J for 1 1/2" & 2") must be used. The corrugated stainless steel tubing portion of the gas piping system shall not be used as the point of attachment of the bonding conductor at any location along its length under any circumstances. See examples provided in Figures 1 and 2.*

Proper bonding and grounding will reduce the risk of damage and fire from a lightning strike. Lightning is a highly destructive force. Even a nearby lightning strike that does not strike a structure directly can cause all electrically conductive systems in the structure to become energized. If these systems are not adequately bonded, the difference in electrical potential between the systems may cause the charge to arc from one system to another. Arcing can cause damage to CSST. Direct bonding and grounding as set forth above will reduce the risk of arcing and related damage over a non direct bonded system.

Depending upon conditions specific to the location of the structure in which the Gastite system is being installed, including but not limited to whether the area is prone to lightning, the owner of the structure should consider whether a lightning protection system is necessary or appropriate. Lightning protection systems are beyond the scope of this bulletin, but are covered by NFPA 780, the Standard for the Installation of Lightning Protection Systems and other standards.

Figure 1 Bonding Clamp on Gastite CSST fitting.  
(Erico clamp # CWP1J, CWP2J or CWP3J)

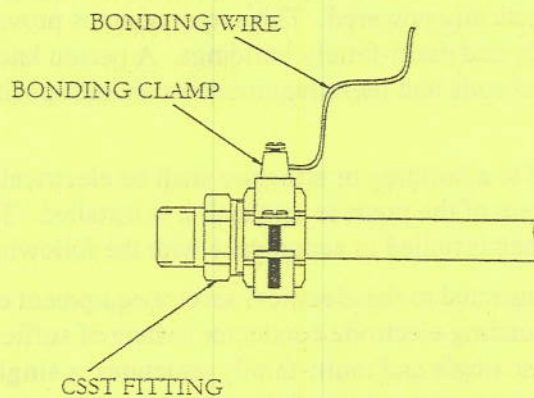


Figure 2 Bonding Clamp on Steel Pipe Segment or Gastite Stub-Out.  
(Remove any paint or coating on pipe surface beneath clamp location)

