

**NC Department of Insurance
Office of the State Fire Marshal - Engineering Division
1202 Mail Service Center, Raleigh, NC 27699-1202
919-647-0000**

**CSST Bonding Requirements for Contractors and Code Official
(Arc-Resistant CSST Bonding)**

Code: 2018 Fuel Gas Code

Date: August 26, 2019

Section: 310.1.1

Code: 2018 NC Residential Code

Section: G2411.1

Question:

What Certificate is the Code Official required to have in order to inspect the bonding of CSST piping required by NC FGC Section 310.1.1?

Answer:

A Level I Electrical Certificate at a minimum.

Follow-up Question #1:

Is the contractor required to have an electrical contractor's license to perform the bonding of CSST?

Answer:

NC General Statute 87-43 requires an electrical contractor's license when installing wiring or equipment. NC General Statute 87-43.1 provides exceptions for when a license is not required, which includes the bonding of CSST. An electrical contractors license is not required if the bonding can be properly performed outside of the electrical panel. This is as a result of an amendment to NCGS 87-43.1 (8) which became effective April 24th, 2013¹.

Per the State Board of Examiners of Electrical Contractors, in instances where it is required to enter the electrical panel to perform the required bonding, the contractor would be required to hold an electrical contractors license. Further information on this topic can be found on the State Board of Examiners of Electrical Contractors website at the following link:

<http://ncbeec.org/wp-content/uploads/2013/05/CSST-Bonding-Board-Determination-Letter.pdf>

The letter referenced in the link above is attached to the end of this document for convenience.

¹ <http://www.ncga.state.nc.us/Sessions/2013/Bills/Senate/PDF/S148v3.pdf>

Follow-up Question #2:

For **arc-resistance coating**, NC-specific code language allows an exception to the supplemental bonding requirements of 310.1.1. However, does the NC Electrical code Article 250.104(B) require it to be bonded with #6 cu?

Answer:

No.

Here is a reprint of NC Electrical Code 250.104 (B) (2017) for reference:

(B) Other Metal Piping. If installed in, or attached to, a building or structure, a metal piping system(s), including gas piping, that is likely to become energized shall be bonded to any of the following:

- (1) Equipment grounding conductor for the circuit that is likely to energize the piping system
- (2) Service equipment enclosure
- (3) Grounded conductor at the service
- (4) Grounding electrode conductor, if of sufficient size
- (5) One or more grounding electrodes used, if the grounding electrode conductor or bonding jumper to the grounding electrode is of sufficient size

The bonding conductor(s) shall be sized in accordance with 250.122, and equipment grounding conductors shall be sized in accordance with Table 250.122 using the rating of the circuit that is likely to energize the piping system(s). The points of attachment of the bonding jumper(s) shall be accessible.

As can be seen in the excerpt, there is no unique requirement for bonding CSST vs. any other metal gas piping from the NEC perspective. The most typical scenario used to bond gas piping (CSST or other) is via Article 250.104(B)(1), whereby the gas piping is connected to the appliance usually with metallic threaded couplings that are metal-to-metal. With the metal-to-metal attachment of the CSST coupling to the gas inlet of the bonded appliance, this is meeting 250.104(B)(1), as this fulfills the "...shall be bonded to any of the following.." requirement, as the gas piping is now electrically continuous with the equipment grounding conductor.

Also please refer to definitions in NC Electrical Code, chapter 1:

Bonded (Bonding). Connected to establish electrical continuity and conductivity.

The metal-to-metal pipe threads provide the bonding.

Follow-up Question #3

The 2012 code, prior to any amendments, required the bonding to occur where the gas service entered the building. In the 2018 code, several sections were added under the CSST Bonding section, (310.1.1.1 – 310.1.1.5) are any of these requiring the bond point connection to be where the gas service enter the building?

Answer:

No.

Section 310.1.1.1 or following subsections do not require the bonding connection be attached where the gas service enters the building. In any given building it may be the most practical place to put it, but it is not the only place. Section 310.1.1.3 does put a hard limit of 75 ft for the maximum length, no matter where it is connected. Also, Sections 310.1.1.4 refers to NFPA 70 (this would be the NC Electrical Code) on how the bonding connection is to be properly done, and Section 310.1.1.5 clarifies that the bonding devices used need to be listed in accordance with UL 467.

Although a licensed electrician may not be required by the NC State Board of Examiners of Electrical Contractors to perform the bonding connections, whoever does the connections has to do it in no less of a compliant manner than is required by the Fuel Gas Code and the NC Electrical Code.

Follow-up Question #4

When buying or selling a home, the Licensed Home Inspector noted potential issues with the CSST. Is lawfully installed CSST piping that was installed prior to the code requiring it be bonded with #6 copper required to be brought up to current standards?

Answer

The supplemental bonding requirements are not retroactive by minimum code. It can be very difficult to know when a given installation precisely occurred, therefore difficult to ascertain whether the installation was compliant with the codes at the time of installation (lawfully installed) or if the requirement was missed. The generic CSST statement offered by a Licensed Home Inspector is a recommendation the issue be reviewed by someone with more expertise in electrical bonding and CSST; **not necessarily that the existing system shall** be bonded in accordance with present code.

See standard language at following link:

https://www.ncdoi.com/OSFM/Engineering_and_Codes/Documents/HILT_Documents/CSS_TGasPiping.pdf

Keywords:

Energized electrical panels

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STATE BOARD OF EXAMINERS OF ELECTRICAL CONTRACTORS

October 2, 2013

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Mr. Moeller:

During its meeting held September 19, 2013, the Board considered your question regarding the recent law amendment to NCGS 87-43.1, the statute which lists exceptions from the requirement to hold license as an Electrical Contractor. The new language provides as follows: *"The provisions of this Article shall not apply to the bonding of corrugated stainless steel tubing (CSST) gas piping systems as required under Section 310.1.1 of the 2012 N.C. Fuel Gas Code."*

The following response is submitted:

Question

Does this mean that anyone, licensed or unlicensed, can open the panel, remove the cover and install the ground wire for the bonding?

Board Response

The Board carefully considered all aspects of this issue with respect to Section 310.1.1 of the 2012 N.C. Fuel Gas Code, the best interest of the unlicensed CSST installers and the best interest of the public. The Board determined that the referenced exemption provision of NCGS 87-43.1 would apply to installing the bonding conductor from the point where the gas service enters the building or structure and running it to a readily accessible external mounted intersystem bonding termination device, an approved grounding electrode conductor or an approved grounding electrode such as the metal frame of the building or structure, rod, or pipe, but outside of any energized electrical panels. The Board further determined that, when such external connections are not available, a licensed electrical contractor will be required to make the connection inside an energized electrical panel, or provide a termination device for use by the public.

William H. Moeller
October 2, 2013
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The Board appreciates your interest in this matter. If we can assist you further, please let us know.

Sincerely,



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