



CSI: DIVISION: 23 00 00—HEATING, VENTILATING AND AIR CONDITIONING
Section: 23 11 00—Facility Fuel Piping

Product certification system:

The ICC-ES product certification system includes testing samples taken from the market or supplier's stock, or a combination of both, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the supplier's quality system.

Product: Gastite® FlashShield™ and FlashShield+™ Metallically Shielded Corrugated Stainless Steel Tubing

Listee: Titeflex Corporation Gastite Division
1116 Vaughn Parkway
Portland, Tennessee 37148
www.gastite.com

Compliance with the following codes:

2021, 2018, 2015, 2012 and 2009 *International Fuel Gas Code*® (IFGC)
2021, 2018, 2015, 2012 and 2009 *International Mechanical Code*® (IMC)
2021, 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)
2021, 2018, 2015, 2012 and 2009 *Uniform Plumbing Code*® (UPC)*
2021, 2018, 2015, 2012 and 2009 *Uniform Mechanical Code*® (UMC)*

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Compliance with the following standards:

ANSI LC 1/CSA 6.26-2019, Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST)
NFPA 54-2021, National Fuel Gas Code
ICC-ES LC1027-2016, PMG Listing Criteria for A Protective Jacketed, Corrugated Stainless Steel Tubing (A Minimum 36 Coulomb Charge Transfer)

Identification:

Tube: Each 2 feet (610 mm) of tube bears the Gastite® FlashShield™ or FlashShield+™ name, part number, rated pressure [25 psi (172 kPa)], equivalent hydraulic diameter (EHD), the words "Fuel Gas," and the ICC-ES PMG listing mark.

Components: Fittings, termination outlets and distribution manifolds are stamped with the Titeflex logo, the part numbers and the date stamp.

Installation:

General: Installation must be in accordance with the Gastite® FlashShield™ or FlashShield+™ Installation Instructions, IFGC Section 404, IRC Section 2415, UMC Section 1309 and UPC Section 1211, as applicable. The system installation consists of CSST distribution lines installed between the point of delivery and fuel gas appliances. CSST not in contact with the ground, but exposed to the outdoors, must be installed in accordance with IFGC Section 404.7, IRC Section G2415.7, IAPMO UMC Section 1312.2, or IAPMO UPC Section 1211.2, as applicable. Distribution lines must be protected from physical damage at points of support and when passing through structural members such as studs, joists and plates by the installation of approved pre-manufactured mechanical devices such as striker plates and oversized strip-wound metal conduit. In areas enforcing the IFGC or IRC, installation of the tubing is not permitted within ducts. The CSST must be sized in accordance with capacity tables in the manufacturer's published installation instructions.

The system is used with supply pressures not exceeding 25 psi (170 kPa), and for low pressure [below 1/2 psi (3.4 kPa)] and medium pressure [2 psi (13.8 kPa)] equipment applications. Low pressure applications with system supply pressures below 1/2 psi (3.4 kPa) do not require a line regulator. System supply pressures exceeding 1/2 psi (3.4 kPa), but less than 2 psi (13.8 kPa) utilize a line regulator to limit downstream appliance utilization pressure to 1/2 psi (3.4 kPa). System supply pressures that exceed 2 psi (13.8 kPa), but do not exceed 25 psi (170 kPa) require a line regulator to limit downstream appliance utilization pressure to 1/2 psi (3.4 kPa), and an additional over-pressure protection device, installed between the line regulator and the appliance, to limit pressure to 2 psi (13.8 kPa). Medium pressure equipment applications with 2 psi (13.8 kPa) and greater supply pressures require a line regulator to limit downstream appliance utilization pressure to 2 psi (13.8 kPa). At supply pressures in excess of 2 psi (13.8 kPa), downstream appliance controls rated for the supply pressure, or protection by some other means, is needed.

The product must be used only with natural gas and propane at operating pressures not exceeding 25 psi (170 kPa). Pressure regulators are required when fuel supply pressures exceed 1/2 psi (3.4 kPa).

Plenum Installation: When tested in accordance with ASTM E 84, Gastite® FlashShield™ and FlashShield+™ satisfies the plenum installation requirement, with a flame spread index of less than 25 and a smoke development index of less than 50.

Electrical Bonding: The Gastite® FlashShield™ and FlashShield+™ Metallically Shielded Corrugated Stainless Steel Tubing (CSST) System is electrically continuous and is considered to be bonded where it is connected to appliances that are connected to the equipment grounding conductor of the circuit supplying that appliance. Additional bonding prescribed by IFGC Section 310.1.1 and IRC Section G2411.1.1 is not required for Gastite® FlashShield™ or FlashShield+™ Metallically Shielded CSST when it is installed in accordance with this listing.

Models:

The Gastite Flexible Gas Piping System is a fuel-gas piping system for natural or propane gas, intended for installation with fuel gas pressures not exceeding 25 psi (170 kPa); the system is installed in interior locations, and in exterior locations as permitted by applicable code.

The Gastite® FlashShield™ and FlashShield+™ Metallically Shielded CSST System consists of five parts: (1) a black polymer exterior jacket; (2) metal shield to conduct the stray current; (3) a black polymer interior jacket (4) corrugated stainless steel tubing conforming to ANSI LC-1; and (5) mechanical fittings designed for use only with the Gastite® FlashShield™ CSST.

Mechanical fittings utilize a metal-to-metal seal, and include mechanical fittings, distribution manifolds, shutoff valves, termination outlet devices, pressure regulators, tee assemblies and protection devices. Protective metal shield in the multi-layer product must be electronically engaged with each fitting.

TABLE — PART NUMBERS: GASTITE® FLASHSHIELD™ AND FLASHSHIELD+™ TUBING AND FITTINGS

TUBING SIZE (inch)	PART NUMBER	DESCRIPTION
1/2	FS-8	1/2" FlashShield™ CSST
3/4	FS-11	3/4" FlashShield™ CSST
1	FS-16	1" FlashShield™ CSST
1 1/4	FS-20	1 1/4" FlashShield™ CSST
1 1/2	FS-24	1 1/2" FlashShield™ CSST
2	FS-32	2" FlashShield™ CSST
1/2	XR3FTG-8	1/2" XR3 Straight Fitting -- 1/2" NPT
3/4	XR3FTG-11	3/4" XR3 Straight Fitting -- 3/4" NPT
1	XR3FTG-16	1" XR3 Straight Fitting -- 1" NPT
1 1/4	XR3FTG-20	1 1/4" XR3 Straight Fitting -- 1 1/4" NPT
1 1/2	XR3FTG-24	1 1/2" XR3 Straight Fitting -- 1 1/2" NPT
2	XR3FTG-32	2" XR3 Straight Fitting -- 2" NPT
1/2	XR3FTG-FM-8	1/2" XR3 Straight Fitting -- 1/2" Female NPT
3/4	XR3FTGFM-11-8	3/4" XR3 Straight Fitting -- 1/2" Female NPT
3/4	XR3FTGFM-11	3/4" XR3 Straight Fitting -- 3/4" Female NPT
1/2	XR3REDFTG-8-12	1/2" FlashShield™ Straight Reducing Fitting -- 3/4" NPT
3/4	XR3REDFTG-11-08	3/4" XR3 Straight Reducing Fitting -- 1/2" NPT
1	XR3REDFTG-16-12	1" XR3 Straight Reducing Fitting -- 3/4" NPT
1/2	XR3CPL-8	1/2" XR3 Coupling
3/4	XR3CPL-11	3/4" XR3 Coupling
1	XR3CPL-16	1" XR3 Coupling
1 1/4	XR3CPL-20	1 1/4" XR3 Coupling
1 1/2	XR3CPL-24	1 1/2" XR3 Coupling
2	XR3CPL-32	2" XR3 Coupling
1/2	XR3TRM-8	1/2" XR3 Termination Fitting -- 1/2" NPT
3/4	XR3TRM-11	3/4" XR3 Termination Fitting -- 3/4" NPT
1	XR3TRM-16	1" XR3 Termination Fitting -- 1" NPT
1 1/4	XR3TRM-20	1 1/4" XR3 Termination Fitting Assembly -- 1 1/4" NPT
1 1/2	XR3TRM-24	1 1/2" XR3 Termination Fitting Assembly -- 1 1/2" NPT
2	XR3TRM-32	2" XR3 Termination Fitting Assembly -- 2" NPT
1/2	XR3T-8	1/2" Run x 1/2" Run x 1/2" XR3 Tee Fitting
3/4	XR3T-11	3/4" Run x 3/4" Run x 3/4" XR3 Tee Fitting
1	XR3T-16	1" Run x 1" Run x 1" XR3 Tee Fitting
3/4	XR3T-11-8-8	3/4" Run x 1/2" Run x 1/2" XR3 Tee Fitting
3/4	XR3T-11-11-8	3/4" Run x 3/4" Run x 1/2" XR3 Tee Fitting
1	XR3T-16-11-8	1" Run x 3/4" Run x 1/2" XR3 Tee Fitting
1	XR3T-16-11-11	1" Run x 3/4" Run x 3/4" XR3 Tee Fitting
1	XR3T-16-16-8	1" Run x 1" Run x 1/2" XR3 Tee Fitting
1	XR3T-16-16-11	1" Run x 1" Run x 3/4" XR3 Tee Fitting
1/2	FSP-8	1/2" FlashShield+™ CSST
3/4	FSP-11	3/4" FlashShield+™ CSST
1	FSP-16	1" FlashShield+™ CSST
1 1/4	FSP-20	1 1/4" FlashShield+™ CSST
1 1/2	FSP-24	1 1/2" FlashShield+™ CSST
2	FSP-32	2" FlashShield+™ CSST

For **SI**: 1 inch = 25.4 mm.

Conditions of listing:

1. Gastite® FlashShield™ and FlashShield+™ have been tested (in accordance with LC1027) and complies with the minimum performance threshold for indirect effects lightning testing.
 - Indirect Effects 1 Threshold: 10 coulombs minimum utilizing a 10 x 1000 µs current waveform
 - Indirect Effects 2 Threshold:

Component 1 (Return Stroke)	
Peak Amplitude	30 kA minimum
Action Integral	0.055 x 10 ⁶ A ² s, minimum
Time Duration	≤ 500 µs
Component 2 (Intermediate Current)	
Maximum Charge Transfer	10 coulombs (± 10%)
Average Amplitude	2 kA (± 20%)
Time Duration	≤ 5 ms
Component 3 (Continuing Stroke)	
Amplitude	200 – 800 A
Charge Transfer	26 coulombs, minimum
2. Electrical Bonding: The FlashShield™ and FlashShield+™ Metallically Shielded Corrugated Stainless Steel Tubing System is electrically continuous and is considered to be bonded where it is connected to appliances that are connected to the equipment grounding conductor of the circuit supplying that appliance.
3. The protection is from indirect lightning only and the effect of direct lightning strike is beyond the scope of this listing.
4. The CSST piping system must not be used as a grounding electrode for an electrical system.
5. Protective metallic shield in the multi-layer product must be electronically engaged with each fitting.
6. The Gastite® FlashShield™ and FlashShield+™ Metallically Shielded CSST System under a quality control program with bi-annual surveillance inspections by ICC-ES.