

ICC-ES Report

PMG-1155

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Reissued 01/2018
This report is subject to renewal 01/2019

EVALUATION SUBJECT:

GASTITE® FLASHSHIELD™ METALLICALLY SHIELDED CORRUGATED STAINLESS STEEL TUBING

DIVISION:

23 00 00—HEATING, VENTILATING AND AIR CONDITIONING

SECTION:

23 11 00—FACILITY FUEL PIPING

Report Holder:

TITEFLEX CORPORATION GASTITE DIVISION

1116 VAUGHN PARKWAY
PORTLAND, TN 37148

Look for the ICC-ES marks of Conformity!



ICC-ES PMG Product Certificate

PMG-1155

Effective Date: January 2018

This listing is subject to re-examination in one year.



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A Subsidiary of the International Code Council®

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™ 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:

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

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Compliance with the following standards:

ANSI LC 1/CSA 6.26-2016, Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST)
NFPA 54-2015, 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)
ICC-ES PMG-1019, Gastite Flexible Gas Piping System

Identification:

Tubing: Each 2 feet (610 mm) of tube bears the Gastite® 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™ 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. The use and system installation must be in accordance with ICC-ES PMG-1019.

Plenum Installation: When tested in accordance with ASTM E 84, Gastite® 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™ 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™ Metallically Shielded CSST when it is installed in accordance with this listing.

Models:

The Gastite® 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 which is recognized in PMG-1019 as 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™ 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	FSFTG-8	1/2" FlashShield™ Straight Fitting -- 1/2" NPT
3/4	FSFTG-11	3/4" FlashShield™ Straight Fitting -- 3/4" NPT
1	FSFTG-16	1" FlashShield™ Straight Fitting -- 1" NPT
1 1/4	FSFTG-20	1 1/4" FlashShield™ Straight Fitting -- 1 1/4" NPT
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-20	1 1/4" XR3 Straight Fitting -- 1 1/2" NPT
2	XR3FTG-16	2" XR3 Straight Fitting -- 1" NPT
1/2	FSFTG-FM-8	1/2" FlashShield™ Straight Fitting -- 1/2" Female NPT
3/4	FSFTGFM-11-8	3/4" FlashShield™ Straight Fitting -- 1/2" Female NPT
3/4	FSFTGFM-11	3/4" FlashShield™ Straight Fitting -- 3/4" Female 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
3/4	FSREDFTG-11-08	3/4" FlashShield™ Straight Reducing Fitting -- 1/2" NPT

TUBING SIZE (inch)	PART NUMBER	DESCRIPTION
1	FSREDFTG-16-12	1" 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	FSCPL-8	1/2" FlashShield™ Coupling
3/4	FSCPL-11	3/4" FlashShield™ Coupling
1	FSCPL-16	1" FlashShield™ Coupling
1 1/4	FSCPL-20	1 1/4" FlashShield™ Coupling Assembly
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	FSTRM-8	1/2" FlashShield™ Termination Fitting – 1/2" NPT
3/4	FSTRM-11	3/4" FlashShield™ Termination Fitting – 3/4" NPT
1	FSTRM-16	1" FlashShield™ Termination Fitting – 1" NPT
1 1/4	FSTRM-20	1 1/4" FlashShield™ Termination Fitting Assembly
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	FST-8	1/2" Run x 1/2" Run x 1/2" Tee Fitting
3/4	FST-11	3/4" Run x 3/4" Run x 3/4" Tee Fitting
1	FST-16	1" Run x 1" Run x 1" Tee Fitting
3/4	FST-11-8-8	3/4" Run x 1/2" Run x 1/2" Tee Fitting
3/4	FST-11-11-8	3/4" Run x 3/4" Run x 1/2" Tee Fitting
1	FST-16-11-8	1" Run x 3/4" Run x 1/2" Tee Fitting
1	FST-16-11-11	1" Run x 3/4" Run x 3/4" Tee Fitting
1	FST-16-16-8	1" Run x 1" Run x 1/2" Tee Fitting
1	FST-16-16-11	1" Run x 1" Run x 3/4" Tee Fitting
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

For SI: 1 inch = 25.4 mm.

Conditions of listing:

1. Gastite® FlashShield™ has 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	$0.055 \times 10^6 \text{ A}^2\text{s}$, minimum
Time Duration	$\leq 500 \text{ } \mu\text{s}$
Component 2 (Intermediate Current)	
Maximum Charge Transfer	10 coulombs ($\pm 10\%$)
Average Amplitude	2 kA ($\pm 20\%$)
Time Duration	$\leq 5 \text{ ms}$
Component 3 (Continuing Stroke)	
Amplitude	200 – 800 A
Charge Transfer	26 coulombs, minimum
2. Electrical Bonding: The 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. Additional information and requirements are defined in ICC-ES PMG-1019.
6. Protective metallic shield in the multi-layer product must be electronically engaged with each fitting.
7. The Gastite® FlashShield™ Metallically Shielded CSST System is manufactured by Titeflex Corporation Inc. in Portland, Tennessee, under a quality control program with annual surveillance inspections by ICC-ES.



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