

FLEXIBLE GAS PIPING

CSST: INSIDE AND OUT



From Black Iron Pipe to CSST

In the early 90s, Corrugated Stainless Steel Tubing (CSST) is introduced as a safer, smarter alternative to iron piping for natural gas and propane delivery in homes and businesses.



SCHEDULE 40 BLACK IRON PIPE



CORRUGATED STAINLESS STEEL TUBING

CSST Benefits

- Installs in 1/3 the time of rigid piping
- Continuous lengths are pre-marked by the foot
- No pipe cutting, threading or waste
- 75% fewer connection points reduces leak risk
- CSST is lightweight, making for easier handling

CSST QUICKLY GAINS TRACTION

- Approved by construction, fuel and electrical regulatory bodies
- Installed in over 10 million homes by 2012
- Represents over 50% of residential gas piping market

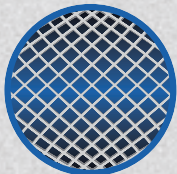


FlashShield™ Sets the Standard for Safety—Indoors and Out

First protective jacketed flexible gas piping to provide protection from electrical system faults and lightning threats.



The only CSST to meet ANSI LC 1 and ICC-ES PMG LC1027 performance standards



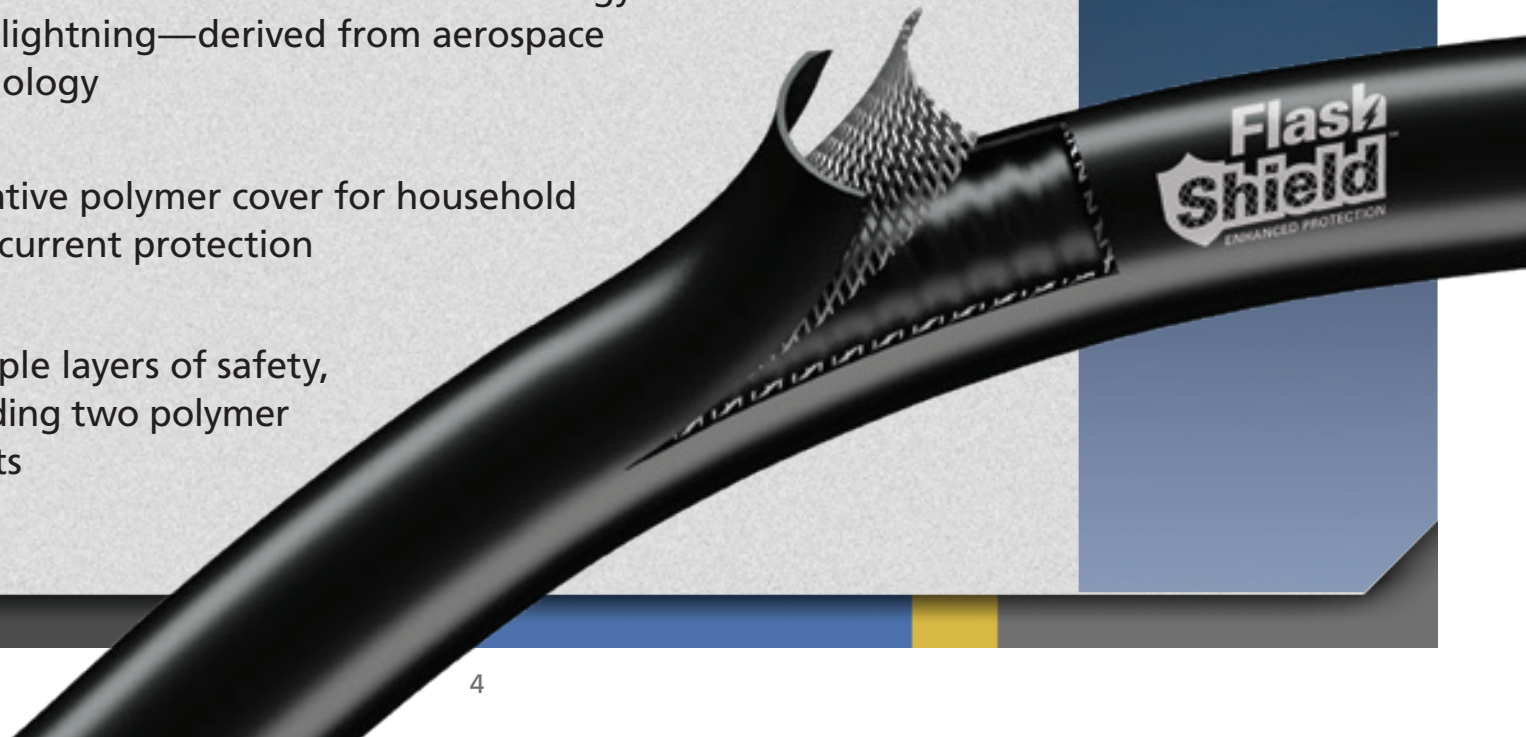
Metallic shield resists and redirects energy from lightning—derived from aerospace technology



Insulative polymer cover for household fault current protection



Multiple layers of safety, including two polymer jackets



FlashShield™ Continues to Raise the Bar

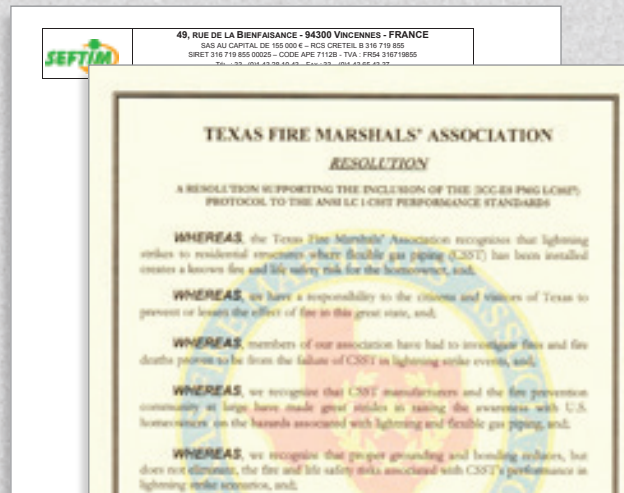
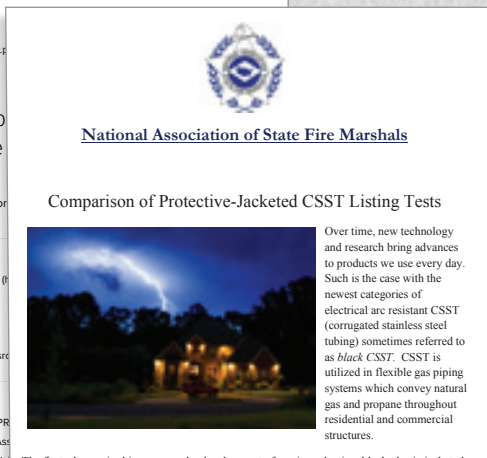
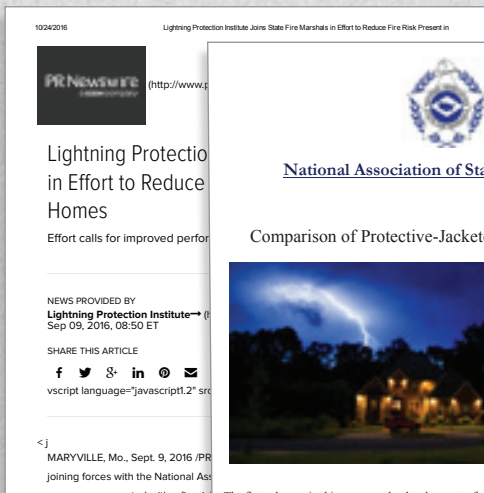
- Annealed 304 stainless steel makes tubing more flexible
- Shield-to-fitting contact for enhanced electrical continuity
- Patented XR3™ Fitting
- FlashShield Stripper Tool





LC1027 Endorsements

- National Association of State Fire Marshals
- Lightning Protection Institute
- SEFTIM Engineering
- Texas Fire Marshals Association
- ICC Fire Service Membership Council
- International Association of Fire Chiefs



Guards Against Direct and Indirect Lightning Strikes

Competing protective jacketed black CSST is tested ONLY to withstand electrical arcing based on INDIRECT lightning strikes. FlashShield metallically shielded CSST is tested to withstand both simulated DIRECT and INDIRECT lightning strikes.



INDIRECT STRIKE



DIRECT STRIKE

Performance Standards/Listings

Arc resistance tests used by CSST industry

| Parameter | ICC-ES PMG Listing Criteria | |
|--------------------------|---|--|
| | ANSI LC 1 | ICC-ES PMG LC1027 |
| Test Charge (Coulombs) | 4.5 C | 36 C |
| Min. Peak Current (Amps) | 1,000 A | 30,000 A |
| Test Charge Basis | Assumption of 2-coulomb maximum transient arcing energy w/in building | 50th percentile of negative lightning flashes measured @ ground* |
| Waveform | Induced current waveform | Composite waveform representing lightning currents** |

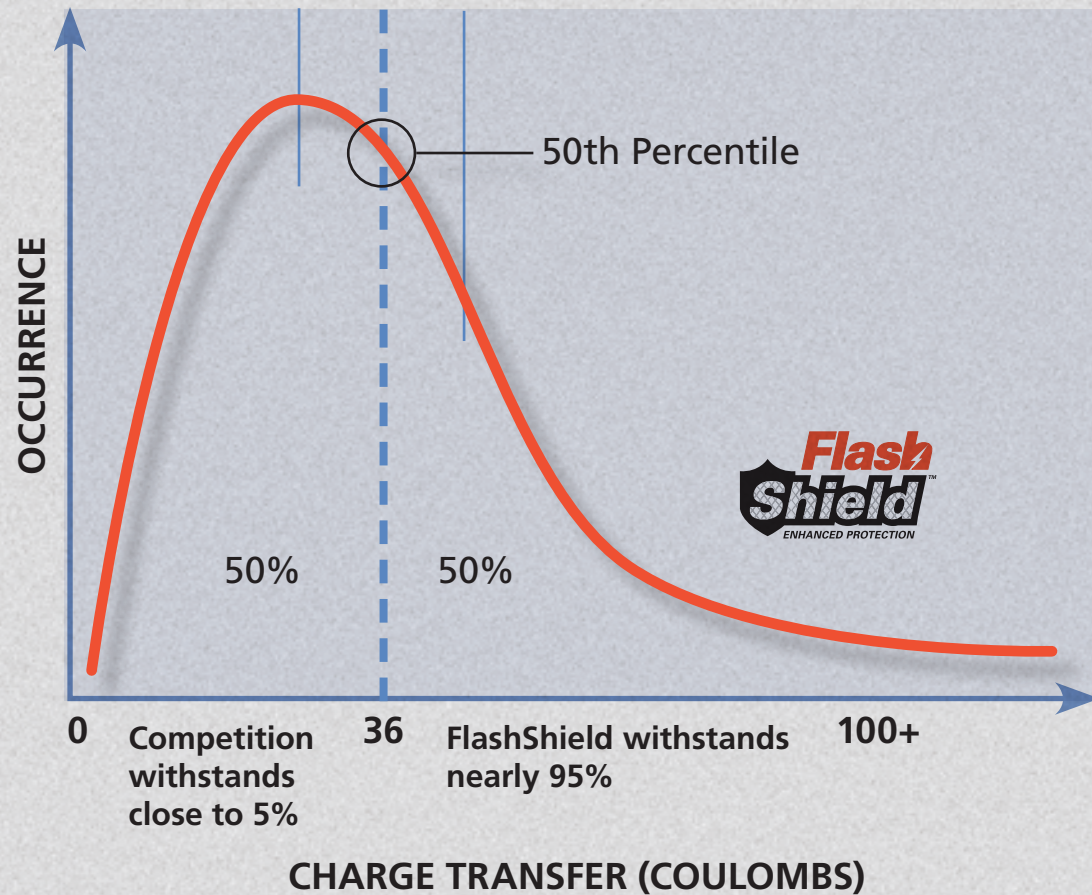
*Informed from SAE ARP5412B Aerospace Recommended Practice, *Aircraft Lightning Environment and Related Test Waveforms*

**Accepted as a better representation of actual lightning strikes versus the ANSI LC 1 waveform.

Lightning Strikes Size and Frequency

Negative Flash to Ground

The LC1027 standard requires that flexible gas piping withstand a minimum of 50% of simulated direct lightning strikes. In third-party lab tests, FlashShield consistently withstands nearly 95%, while the competition is able to withstand around 5%.



Informed from SEA ARP5412B Aerospace Recommended Practice, *Aircraft Lightning Environment and Related Test Waveforms*

Highest Level of Lightning Protection

10 Times More Lightning Resistance than the Nearest Competitor*

- FlashShield withstands nearly 95% of simulated direct lightning strikes
- CounterStrike® and WARDFLEX® II withstand around 5%

*As shown by independent third-party testing
WARDFLEX II is a registered trademark of Ward Manufacturing, Inc. CounterStrike is a registered trademark of Omegaflex, Inc.

PERCENTAGE OF SIMULATED NEGATIVE STRIKES TO GROUND





Electrical System Fault Current Protection

Insulative polymer outer jacket

- Electrically insulative outer jacket provides protection from electrical system fault current arcs
- Withstands greater than 600 V*

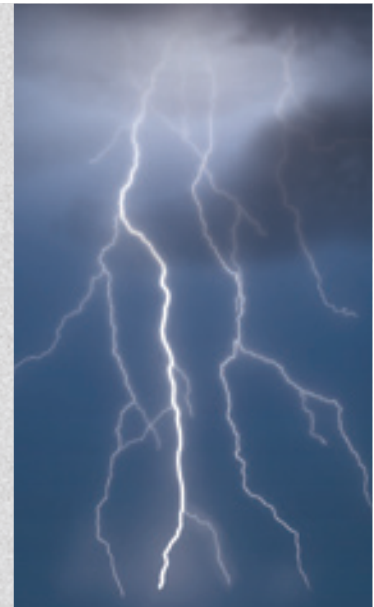
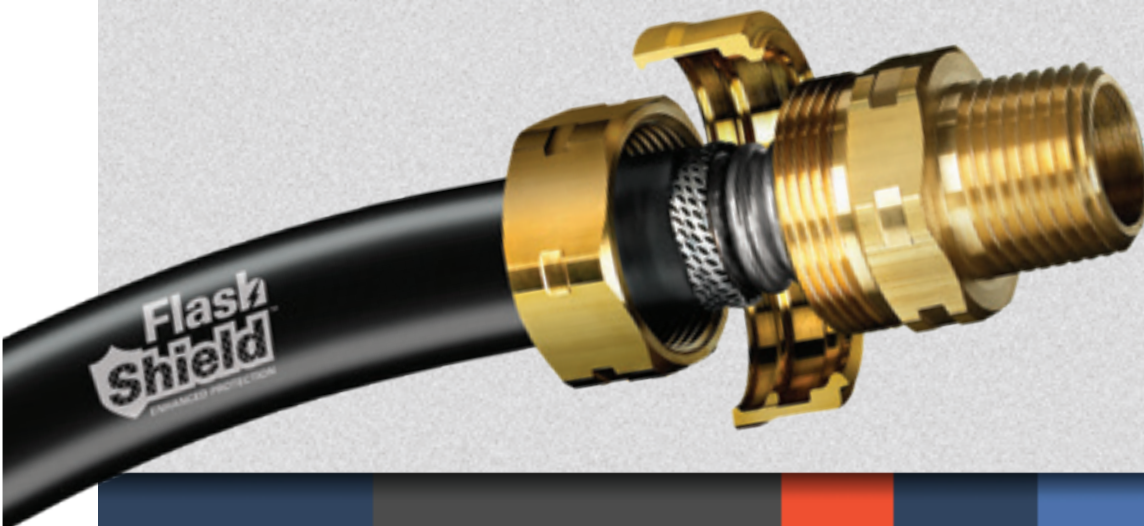
*UL 2556 Wire and Cable Test Methods, Sec. 6.2 Dielectric Voltage-Withstand Test in Air



Flash
Shield
ENHANCED PROTECTION

XR3™ Fitting

- Patented fitting makes contact with the metal mesh
- Metal lock ensures enhanced electrical continuity
- Tool-less flare design
- Metal-to-metal seal, with no split rings, O-rings or gaskets
- Self-guiding assembly ensures a perfectly even flare
- Patented Jacket-Lock™ fitting eliminates exposed stainless steel beyond the nut
- All components are fully reusable



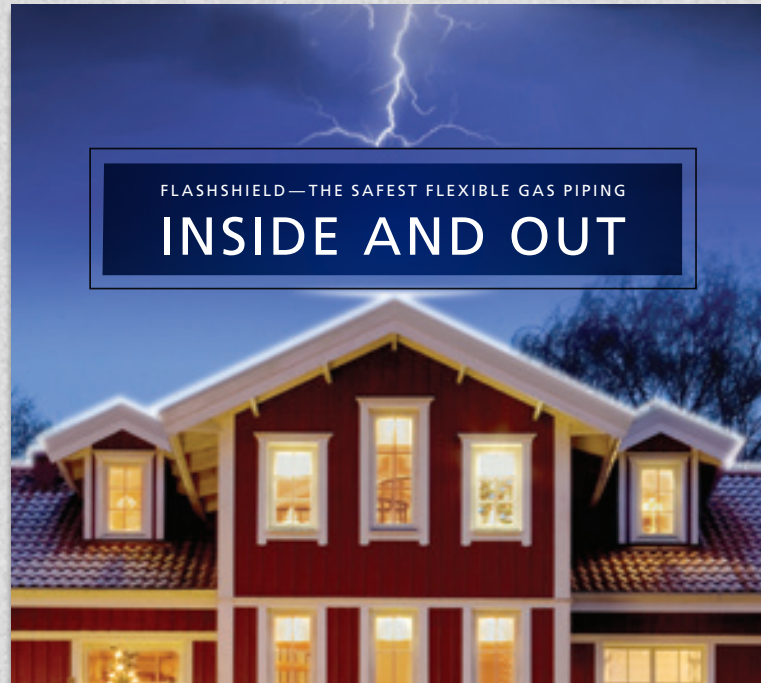


Putting Safety First

At Gastite, our top priority is to continually seek to develop the safest gas distribution systems possible. We're committed to making installation easier for contractors, enhancing safety for homeowners, and mitigating risk for everyone involved.

HERE'S HOW WE DO IT:

- Certification programs
- Industry education and communications
- Trade shows and training updates
- Installation guides
- Rigorous testing
- R&D investment



FLASHSHIELD™ FLEXIBLE GAS PIPING

OFFERS THE BEST CSST PROTECTION



Protect your customers, *their* customers and your reputation by stocking the safest black CSST available.

To learn more, visit gastite.com/flashshield.
Or contact your FlashShield representative.

