

# Lightning Protection for Geodesic Domes



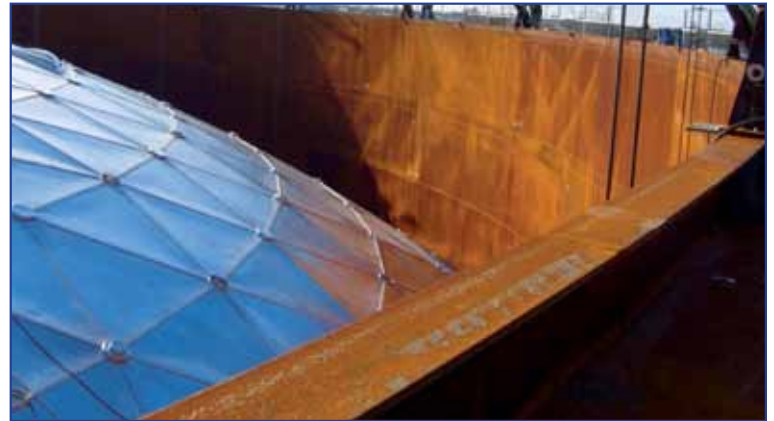
## SUPPLEMENTAL LIGHTNING PROTECTION FOR GEODESIC DOMES

Lightning Master Corporation has teamed up with HMT to create a Supplemental Lightning Protection System for geodesic domes. This system serves to enhance the already-protective Faraday properties that are inherent to geodesic dome structures.

The main component of the system is a network of air terminals which provides two functions. First, the air terminals feature streamer-delaying properties built into their tips, which serve to reduce the incidence of lightning by delaying the formation of streamers on the protected structure, keeping lightning strikes further away from valuable equipment. Second, in the unlikely event of a direct lightning

strike, each air terminal features a UL-listed lightning rod which serves as a point of attachment, lifting the lightning strike up off of the dome and directing the flow of electrical charge to the dome's structural members where it can be most efficiently dissipated to the tank shell and safely to ground.

In addition to air terminals, the system utilizes a series of bonding cables to effectively bond the dome structure to the tank shell, again to ensure efficient and effective dissipation of electrical charge from the dome structure to ground. These cables are sized to handle lightning, versus the typically smaller cables meant to handle only static dissipation.

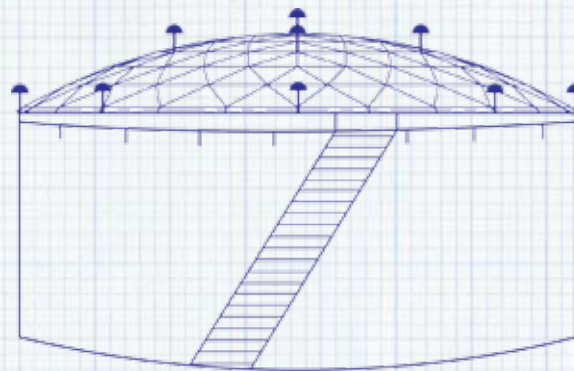
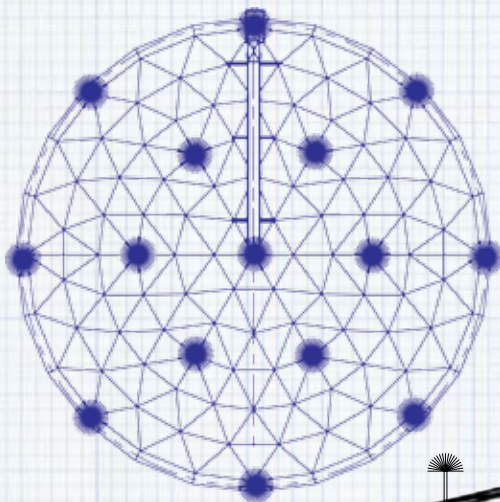


Floating roof bonding and rim-seal best practices are still highly recommended. Tank owners who utilize this Supplemental Lightning Protection System for geodesic domes on tanks with floating roofs should still utilize

API-compliant bonding of the floating roof as well as high-quality seals which are capable of keeping the floating roof rim space tightly sealed and therefore safely above the UEL in the event of arcing in the rim space.

**Since 1984**, Lightning Master Corporation's number one priority has been safety. The health, safety, and environmental needs of our customers' personnel and valuable equipment is our company philosophy, and our employees reflect it every day in their commitment to safety and reliability across the entire range of our products and services.

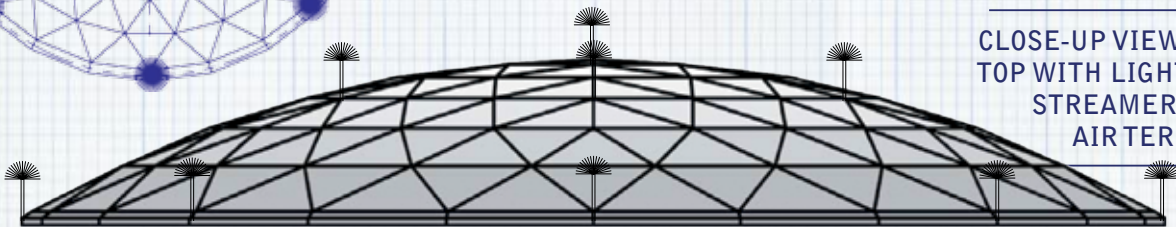
TOP VIEW OF HMT DOME  
WITH LIGHTNING MASTER  
STREAMER-DELAYING AIR TERMINALS



SIDE VIEW OF HMT  
TANK AND DOME  
WITH LIGHTNING  
MASTER STREAMER-  
DELAYING  
AIR TERMINALS

**API AND NFPA COMPLIANT  
LIGHTNING PROTECTION**

CLOSE-UP VIEW OF HMT DOME  
TOP WITH LIGHTNING MASTER  
STREAMER-DELAYING  
AIR TERMINALS



# Lightning Protection for Geodesic Domes



## ABOUT

HMT is the global leader in aboveground storage tank solutions. HMT brings a distinct level of innovation and service to the tank industry through a unique approach of partnering with customers to optimize tank operations. Knowing that every customer's need is different, we use our decades of experience to customize solutions that help tank operations become more efficient, more productive and more profitable.

HMT was founded in 1978 with the objective of providing better technology to the aboveground storage tank market. HMT's founders sought to create products which not only solved the emissions problems of the day but also eliminated the operational issues created by the existing floating roof and seal technologies. The result is better products, better technology and more comprehensive solutions.

**HMT's full suite of tank products includes: External Seal Systems • Internal Seal Systems • Drain and Floating Suction Systems • Geodesic Domes • Skin and Pontoon Floating Roofs • Full Contact Floating Roofs • Emission Reduction Devices**

HMT's global team of engineers, project managers and field personnel can assist with common challenges including ways to reduce emissions, optimize tank capacity, reduce stranded inventory and engineer a tank system that exceeds safety standards and extends maintenance intervals. We have locations worldwide to service all your AST needs.



## ABOUT **LightningMaster**

### Site Survey and Evaluation

- Our field engineers create a detailed report with the findings and recommendations on your site
- Our elite team of experienced engineers perform forensic analysis of lightning and static damage

### Products

- Bonding and Grounding
- Structural Lightning Protection
- Surge Protective Devices
- LMC In-Tank Static Dissipaters – patent pending

### System Design

- We custom-tailor site-specific protection
- We help you write specifications that meet your specific needs

### Customer Service

- Turn-key installation by Lightning Master-employed crews
- Training, supervision, and ongoing support of Customer personnel or contractors
- Lightning Master approved installation contractors (*in selected areas*)

**Lightning Master** is a full service, full spectrum static solutions and lightning and transient protection company, **servicing the oil and gas and chemical industries since 1984**. Our complete line of products and systems is backed by our worldwide support and customer service. Lightning Master has become recognized internationally as the industry leader in lightning and static protection.

### Industry Leaders

Lightning Master Principals serve as members of the National Fire Protection Association NFPA 780, Committee on Lightning Protection, the American Petroleum Institute API 545, committee on lightning protection for hydrocarbon storage tanks. They also served as principal members of NFPA 781, Committee on Lightning Protection using Early Streamer Emitting (ESE) Air terminals and the Institute of Electrical and Electronics Engineers IEEE 1576, committee on lightning protection using charge transfer (static dissipation) systems.

### Technology Development

- Lightning & Static Protection Systems for Salt Water Separation/Disposal Tanks & Batteries - patent pending
- Flowback Tank Static Protection Systems - patent pending