

ESSCO

METAL SPACE FRAME RADOMES

ESSCO space frame radomes are rigid, self-supporting structures that consist of a structural framework with thin, electromagnetically transparent membranes permanently bonded to the framework.

APPLICATIONS

Excellent broadband performance in SATCOM applications at all military and commercial frequency bands, including the C, X, Ku, K and Ka bands.

Also:

- Intelligence gathering
- Radio astronomy
- Weather radar
- 2-D surveillance radar

Standard windspeed design is 150 mph (240 km/hr); optional designs of up to 250 mph (400 km/hr) are available.

CONSTRUCTION AND MATERIALS

ESSCO space frame radomes consist of triangular panels that are bolted together to form a geodesic dome.

For smaller sizes up to 30 ft. (9.1m) in diameter, panels can be either the same basic size and shape (creating a regular geometry) or different sizes and shapes (creating a randomized geometry). For larger radomes, randomized geometries are used. The frame material is a metal aluminum extrusion.

We permanently bond a thin electromagnetically-transmissive membrane material to the frame to create a finished panel. The most commonly used material is ESSCOLAM™, a proprietary plastics laminate we developed and manufacture specifically for radome applications.

Other membrane materials, such as Gore-Tex® or Teflon-coated fiberglass, are also available for special applications. Regardless of the application, we can optimize membrane materials and thickness for enhanced performance at specific frequencies, such as millimeter wave.

KEY FEATURES

- Easy to install
- Hydrophobic coatings for enhanced high-frequency performance in rain
- Electrostatic (Faraday) cage is included to protect against lightning
- Low IMP-free designs for military SATCOM applications
- Customized shapes, including sheds, barns and cylindrical structures

Radomes
and
Mobile
Telecommunications
Systems



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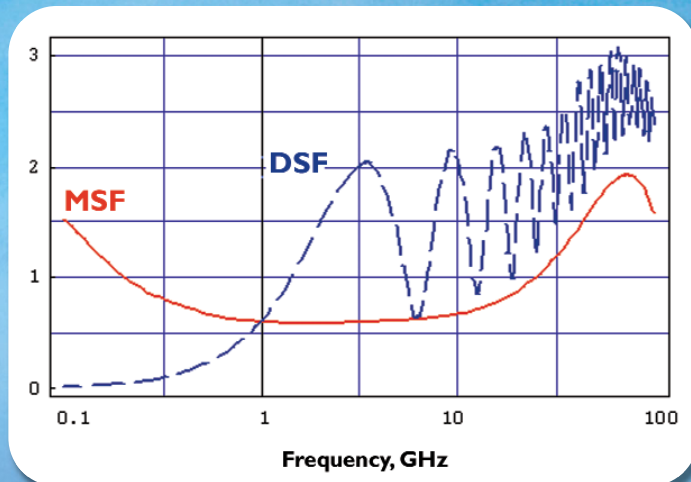
ELECTROMAGNETIC PERFORMANCE

ESSCO space frame radomes perform well over very broad frequency bands. With standard membranes, good performance is obtained from 0.5 to 100 GHz using a metal framework. With high-performance membranes, the operational range is extended to 1000 GHz. At broadband frequencies that go below 0.5 GHz, a dielectric framework may improve overall performance.

The electromagnetic performance of a space frame radome is made up of loss or scattering attributable to 1) the panel frames and 2) the membrane material. The following chart provides typical electro-magnetic performance data. Note the low and relatively constant transmission loss over very wide bandwidths, up through short-millimeter wavelengths.

STANDARD SIZES

Sizes range from 6 to 200 ft. (1.8 to 60.9m) in diameter. Please contact us for more-detailed size information.



Metal Space Frame vs Dielectric Space Frame Transmission Loss, dB



Typical 48-ft (14.7m) diameter MSF radome installation



100-ft (30.6m) diameter MSF radome

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