SANDWICH RADOMES

L-3 ESSCO's sandwich radomes are rigid, self-supporting structures designed to provide outstanding electromagnetic performance for specific frequency bands.

Military vehicle image courtesy of Thales; shipboard radome image courtesy of Harris Corporation.

KEY FEATURES

- Standard wind speed design is 150 mph (240 km/hr.)
- Optional designs withstanding up to 250 mph (400 km/hr.) are available
- Easy to install
- Hydrophobic coatings for enhanced high-frequency performance in rain
- Customized shapes for reduced tower loads or radar cross section

CONSTRUCTION AND MATERIALS

L-3 ESSCO's sandwich radomes are constructed of doubly curved polygonal panels that are bolted together from inside the radome to form a truncated sphere. Individual panels can be either four-sided or polygonal, depending on electromagnetic (EM) requirements. Panel connections are designed to provide structural continuity and weather tightness while minimizing transmission loss.

The sandwich shell is constructed using highly developed composite materials (e.g., sophisticated cloth weaves, resins and foams) to optimize panel consistency and strength. We exclusively use pre-impregnated materials for the surface skins to control both skin thickness and resin content.

Each panel core, which most commonly consists of polyurethane foam for larger radomes, or honeycomb for smaller radomes, is fully enclosed by the surface skins to make the panel weather-tight. Both A-type (three-layer) and C-type (five-layer) construction are available. Varying the skin and core thickness allows for optimum performance at the desired operating frequencies.

The panels include reinforced panel edges that, when assembled, form an overlapping joint with connecting fasteners acting in shear. The outside overlap flange design allows for panel assembly to take place inside the radome and easy panel removal for replacement or repair.

APPLICATIONS

Sophisticated 3-D air surveillance radar for military and commercial SATCOM and civilian air traffic control applications.

Other Applications:

- Weather radar
- Phased-array radar
- Secondary surveillance radar

L-3 ESSCO Excellence Since 1961

SANDWICH RADOMES

ELECTROMAGNETIC PERFORMANCE

L-3 ESSCO's sandwich radomes perform well over relatively narrow frequency bands, or potentially at multiple discrete frequencies. The electromagnetic performance of a sandwich radome is made up of loss or scattering attributable to 1) the central part of the panel window area and 2) the panel flanges. Proper material selection and manufacturing techniques can largely address the first of these factors.

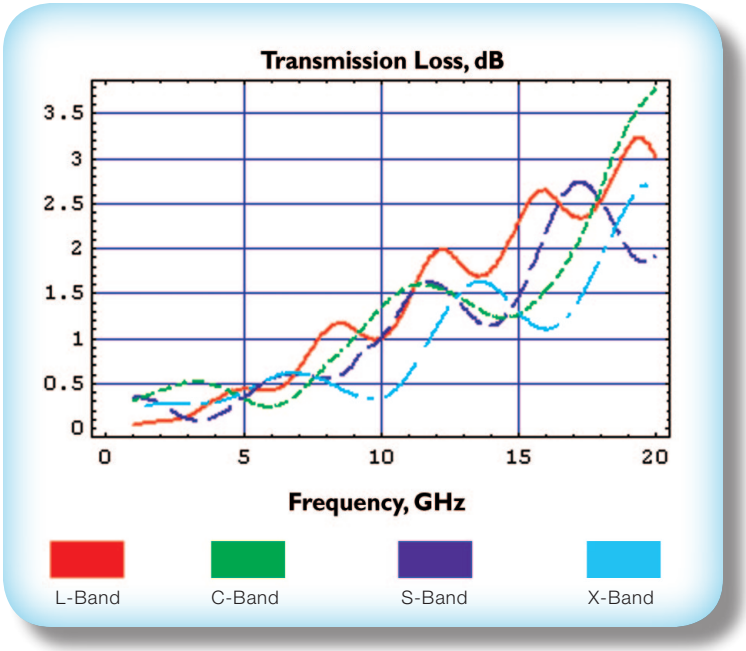
Loss and shift of phase due to the second factor (i.e., the panel flanges) can be nine times that of the panel window area. As a result, the flanges must be tuned or impedance matched to the window area. Using proprietary tuning techniques, L-3 ESSCO has been able to optimize performance of both the window area and the flange over specific frequency bands.

38-ft. (11.6m) diameter sandwich radome.

STANDARD SIZES

Sizes range from 10 to 77 ft. (3.0 to 23.5m) in diameter. Please contact us for detailed size information.

77-ft. (23m) diameter sandwich radome.



Typical Transmission Loss vs. Frequency of Tuned Sandwich Radomes.

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