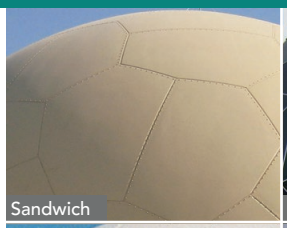
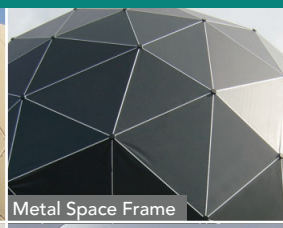
Ground-Based Radomes Selector Guide

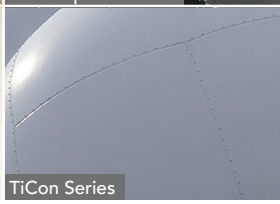
Comparison of Radome Features

What's the most appropriate radome for your application?

To determine the answer, consider factors such as operating frequency, performance requirements, environmental conditions, size and cost. This table provides overviews of the four major ground-based, spherical radome types that CPI ESSCO offers.







Radome Type	Sandwich	Metal Space Frame	Solid Laminate	TiCon Series Weather Radomes
Typical Applications	• 3-D radar (military and commercial SATCOM) • Air traffic control • Weather radar • Phased-array radar • Secondary surveillance radar	• Military and commercial SATCOM • Intelligence gathering • Radio astronomy • Weather radar • 2-D surveillance radar	• Communication and weather radar • Commercial SATCOM • EMI test facilities • Low-frequency applications	• Weather radar/surveillance • Severe weather monitoring • Airport wind shear instruments • Other C-band RF antennas • Dual-polarization antennas
Construction Characteristics	• Multi-layer construction; doubly curved polygonal panels bolted together to form truncated sphere • Shell made of highly developed composites for panel consistency and strength • Pre-preg skins fully enclose each panel core to make panels weather-tight	• Triangular frames oriented and bolted together to form a geodesic dome • Frames made of metal aluminum extrusion • Proprietary ESSCOLAM™ laminate permanently bonded into frames • Other membrane materials available for specific applications • Panel geometries available in both regular and randomized configurations	• Doubly-curved, solid fiberglass panels; thickness depends on radome size and wind speed • Panels arranged in neat vertical and horizontal rows	• Multi-layer composites • Lightweight closed cell foam core • Quasi-random panel geometry for best EM performance • RF tuning for best cross-panel EM performance • Gelcoat outer surface for improved EM performance in rain and snow
Electro-magnetic (EM) Performance	• Excellent performance over relatively narrow frequency bands or potentially at multiple discrete frequencies	• Good performance from 0.5 to 100 GHz with standard membranes • Operational range extended to 1000 GHz with high-performance membranes	• Excellent performance below 3 GHz or at higher frequencies when wall thickness can be tuned for narrow bandwidths	• Optimized for C-band • 4.0 – 6 GHz • Max transmission loss <0.4 dB
Standard Sizes	• 10 to 82 ft. (3.0 to 23.5m) in diameter	• 6 to 200 ft. (1.8 to 60.9m) in diameter	• 42 in. to 18 ft. (1.1 to 5.5m) in diameter	• 22 ft. (6.7m) in diameter/87% truncation • 32 ft. (9.8m)/80% truncation • 38 ft. (11.6m)/82% truncation
Advantages	• Skin and core thickness can be varied for optimum performance at operating frequency • Excellent choice if low sidelobes are critical • Good insulation value • Panel assembly and disassembly from inside radome • Easy panel removal for replacement or repair	• Membrane materials and thickness can be varied for optimum performance at operating frequency • Wide range of sizes to accommodate requirements for design wind speed • Electrostatic cage for lightning protection • Availability of tactical and IMP-free designs • Good EM performance over variety of bands	• A cost-effective option in smaller sizes • Panel assembly and disassembly from inside radome	• Excellent EM performance at C-band • Value-priced to meet your budget • Strong to support up to 150 mph (241 kph) windspeeds • COTS designs for short lead times
Disadvantages	• Tooling required for each new size • EM performance is frequency-discrete • Manufacturing tolerance critical to achieve desired performance • Joint design critical for effective EM performance	• Performance at discrete frequency — not as good as sandwich type • Low-insulation value unless treated with insulating material	• Cost increases and performance decreases with size and wind speed • Panels not randomly oriented, allowing for greater boresight and sidelobe degradation	• Available only in white • Available in three size configurations

Over 50 years of radome excellence

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