

L-3 ESSCO | Radomes

PRODUCTS & CAPABILITIES

SPACE FRAME, SANDWICH & SPECIALTY RADOMES PLUS FIELD SERVICES FOR
AIR TRAFFIC CONTROL | AIRBORNE | SHIPBOARD | RADAR | WEATHER | SATCOM | SPECIALTY APPLICATIONS



WE'VE GOT YOU COVERED!



ESSCO

L-3 ESSCO — COMMITTED TO QUALITY



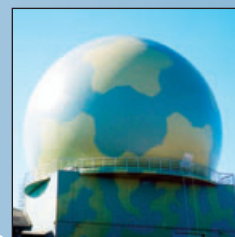
30-ft. (9.1 m)
sandwich radome –
air traffic control



14-ft. (4.3 m) composite
radome – shipboard
communications



93-ft. (28.3 m) metal space
radome undergoing water
test – SATCOM application



62-ft. (18.9 m) camouflaged
sandwich radome –
military radar



18-ft. (5.5 m)
solid laminate radome –
low-frequency applications

TURNKEY SOLUTIONS

In a time of ever-tightening budgets, L-3 ESSCO understands the need to provide greater overall value to our customers. In response, we offer a broad range of site and installation services tailored to meet the requirements of prime contractors and government agencies worldwide, combined with a competitive turnkey approach, handling all phases associated with the site construction process. With sales and installations in over 80 countries worldwide, chances are, if you need an antenna or radome installed somewhere, we have already been there and can provide competitive bids with valuable local content for timely project completion.

DESIGN

At L-3 ESSCO, our customers' performance requirements come first and our staff of design, electromagnetic and manufacturing engineers works closely with our quality and field service technicians to ensure that product designs comply with customer specifications. This fully integrated design approach leads to the continuous improvement of existing products and to the development of new market offerings.

VALUE

Our philosophy regarding design, test and manufacturing is to provide value to our customers by delivering the best performing radomes and antenna systems in the world — at a competitive price. This goal requires quality in all aspects of our business, with processes being done right the first time and defects and waste eradicated from operations.

Our electromagnetic and structural engineers combine their talents and insights to optimize design and performance. Our material engineers consult with our process and manufacturing specialists and our field service professionals for inputs on all of our engineering designs and manufacturing processes.

On the test and evaluation front, L-3 ESSCO has developed highly accurate computer models that enable us to simulate specific antenna applications and accurately predict electromagnetic (EM) performance. Testing done on our focused beam setup, in addition to independent test evaluations, has validated our predictions on a scale model and operating systems basis.

It is this unique, team-driven approach that helps us achieve greater value and more cost-effective solutions for our customers.

CERTIFICATION

As a supplier to the U.S. government, NATO and other worldwide government agencies, we recognize that quality and reliability are vitally important to the overall missions for which these agencies are responsible. That's what drives us to attain the highest level of quality and certification compliance. L-3 ESSCO was the first rigid ground-based radome supplier in the world certified to ISO 9001 and is now the first to be certified to AS9100. In addition, L-3 ESSCO maintains compliance with MIL-Q-9858 and NATO AQAP-4.



Built to Protect. Designed to Endure.

Since 1961, L-3 ESSCO has led the industry in the research and development of new radome technology. From pioneering research in the use of metal beams in radomes, to radome tuning technology, to the development of hydrophobic coatings and the use of advanced composite materials, L-3 ESSCO has always been first to market with new radome enhancements and continues to pursue advancements in electromagnetic and structural performance.

This constant pursuit of quality and excellence makes us the world's undisputed leader in ground-based radomes and RF composite structures. When you need the latest safeguards for your antennas, count on L-3 ESSCO for total protection.

L-3 ESSCO...We've got you covered with:

- **Radomes — Metal Space Frame | Sandwich | Specialty Applications**
- **Low Radar Cross-Section (LRCS) and Frequency-Selective Surface (FSS) radomes**
- **Advanced composite radomes, reflectors and structures**
- **Worldwide turnkey design and installation solutions**
- **Engineering and consulting services**



WORLD'S LEADING MANUFACTURER AND



L-3 ESSCO has delivered and installed over 5,000 radomes in more than 80 countries. No other radome company can match our customer service, record of longevity, reliability, advanced product development, manufacturing support, quality, test & evaluation and in-depth field service capabilities.

35-ft. (10.7 m) diameter oblate radome for digital air surveillance radar application

RADOME BENEFITS

Protection against the elements — L-3 ESSCO radomes protect radars and other antenna systems from wind, rain, snow, ice, blowing sand, salt, solar radiation and freezing temperatures. L-3 ESSCO radomes not only protect the antenna against the elements, they are also “RF transparent,” resulting in predictable, repeatable and reliable antenna performance. In fact, extensive test measurements performed by the U.S. Federal Aviation Administration (FAA) show that its radar performance had no degradation with an L-3 ESSCO radome.

Improved performance — Radome protection ensures that critical system alignments are preserved, pointing and tracking accuracy is improved, and peak performance is achieved 100% of the time. This is critically important for applications such as air traffic control, gun fire control, military radar, remote sensing and high-speed tracking.

Reduced maintenance and downtime —

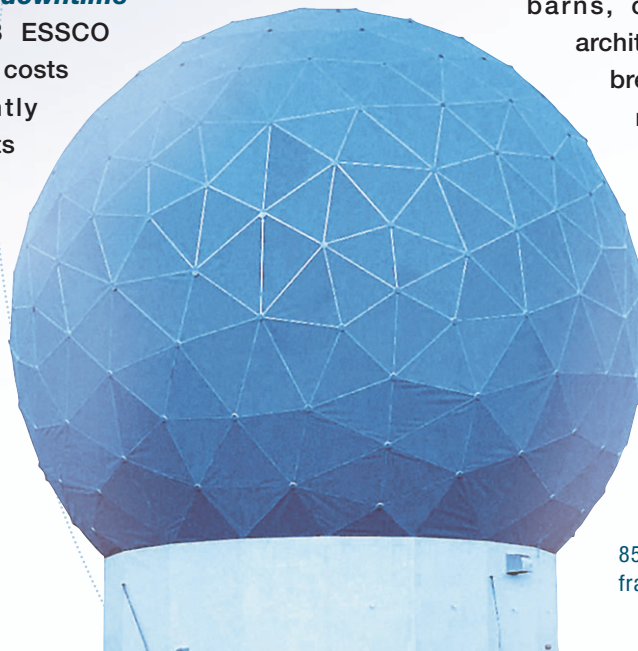
With a properly designed L-3 ESSCO radome, antenna maintenance costs and downtime are significantly decreased. Environmental effects of salt atmosphere, sand penetration and erosion, dust infiltration, ultraviolet radiation, acid rain and humidity are kept outside the system. And degradation of rotating mechanisms, covers, seals and gaskets is dramatically reduced.

Cost-effective — Operating in a “zero” wind environment, a radome-enclosed antenna is generally the most cost-effective solution available, as it can lower the cost of the antenna design and reduce operating and life-cycle costs. Studies indicate that the downtime for a radome-protected antenna averages as little as 20 minutes per year and that savings in the original cost of the antenna can equal or exceed the cost of a radome. The benign environment of a radome means maintenance is required less often, is accomplished in less time and requires fewer personnel.

RADOME TYPES

L-3 ESSCO offers radomes in sizes ranging from 1.5 to 200 feet (0.5 m to over 61.0 m) in diameter and in an array of products that includes space frame, sandwich and specialty composite options. We also produce custom-shaped radomes, including cylinders, flat walls

and cubes, as well as radomes that mimic barns, church steeples or other architectural structures. With our breadth of expertise in different radome types, we can provide objective opinions and trade-offs for specific applications so that our customers can select the radome that best meets their requirements.

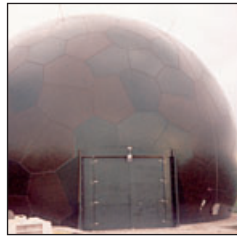


85-ft. (25.9 m) diameter metal space frame radome for SATCOM applications

INSTALLER OF GROUND-BASED RADOMES



57-ft. (17.4 m)
sandwich radome –
weather



77-ft. (23.5 m) sandwich
radome with large
equipment access doors



68-ft. (20.7 m) metal
space frame radome
top cap lift



Submarine radome



8-ft. (2.4 m) radome –
shipboard
communications

SPECIALTY APPLICATIONS

L-3 ESSCO has a long history of producing advanced composite radomes and reflectors that are custom-designed and manufactured to your specific requirements. Using our total quality approach, these precision components and subsystems meet the same high standards of quality we apply to all our products.

We specialize in high-frequency, structurally demanding, critical tolerance applications using advanced composite materials, such as carbon fiber, Kevlar®, Dyneema® and quartz. We also use honeycomb, foam core and other thermo-formable core materials, to design and fabricate parts to meet performance, weight, strength and cost goals. L-3 ESSCO composite products are made using pre-preg materials that are oven or autoclave cured to ensure that uniformity, density and tolerances of parts are maintained during the production process. L-3 ESSCO composite reflectors have typical surface accuracies of five mils (0.005 inch or 0.127 mm) rms.

Using various types of sandwich construction and multilayered Frequency-Selective Surfaces (FSS), we can customize your radome to perform at one or more frequency bands.

L-3 ESSCO has designed radomes to survive ballistic impacts, nuclear environments and other extreme conditions. Proprietary technologies include hydrophobic coatings, electromagnetic tuning, and FSS and Low Radar Cross-Section (LRCS) radome designs. We have manufactured numerous ground-based and airborne reflectors for programs such as Milstar, NESF and Predator, including 90-inch (2.3 m)

diameter and three-piece, 96-inch (2.4 m) diameter reflectors. Other products include radomes for the E-2 Advanced Hawkeye, 15-foot (4.6 m) radome/docking covers for AEGIS-class ships, 6-foot (1.8 m) phased-array radome covers for programs such as Cobra and AN/SPQ-9B, 14-foot (4.3 m) diameter radomes for the AN/WSC-6(V) 9 System (low RCS environment), and 5-foot (1.5 m) diameter advanced composite radomes for the Communications Data Link (CDL) Terminal for reconnaissance/surveillance aircraft carriers. The CDL radome is a high-performance design capable of operating in multiple SATCOM frequency bands through Ku-Band.



Typical sandwich radome installation

SERVICES & SUPPORT

WORLDWIDE SERVICE

L-3 ESSCO field service professionals have been installing, inspecting and maintaining radomes and antenna systems for more than five decades. Our staff of highly qualified technicians and engineers has experience in installing these systems at thousands of sites around the world, giving L-3 ESSCO one of the largest databases of site conditions that might be encountered, which in turn translates to lower overall risk to our customers. We train all of our technicians to the highest standards and follow all OSHA and local safety regulations. Our crews work in environments from arctic to tropic to desert, installing radomes and antennas on towers as high as 600 feet (182.9 m) and at some of the world's most challenging locations.

From full turnkey installations of radomes and antennas to site inspections through periodic maintenance, L-3 ESSCO's field service crews can support all your system's needs.



CONSULTING/SPECIAL SERVICES

As part of our commitment to providing world-class radomes, reflectors and composite structures, we offer a wide variety of custom services and support, including:

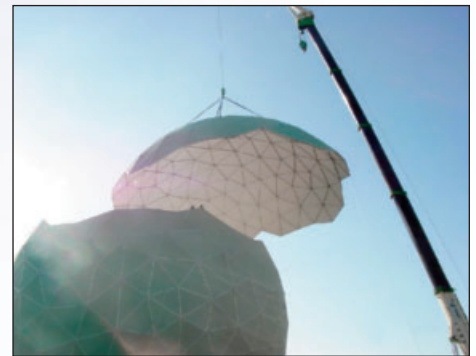
Structural analysis — We offer structural analysis consultation using finite element modeling for radome, antenna and advanced composite applications.

Electromagnetic analysis — If you need precise electromagnetic predictions for radomes and antenna systems, our electromagnetic engineers can provide them to you.

Foundation services — A proper foundation is critical to the performance of an antenna and a successful radome installation. L-3 ESSCO can provide the complete foundation design, verify an existing design, or build to your specifications.

Inspection and repair services — We are especially well-qualified to inspect, evaluate, and, if needed, repair existing systems. We can also make recommendations on how to extend the life of an older system.

MIL-SPEC documentation — If standard documentation is insufficient for your needs, L-3 ESSCO has extensive experience in supplying MIL-SPEC-level documentation.



ESSCO

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