



# RF MICROWAVE PRODUCT AND SERVICE SOLUTIONS

*COMMITTED TO A SMARTER,  
MORE CONNECTED FUTURE*

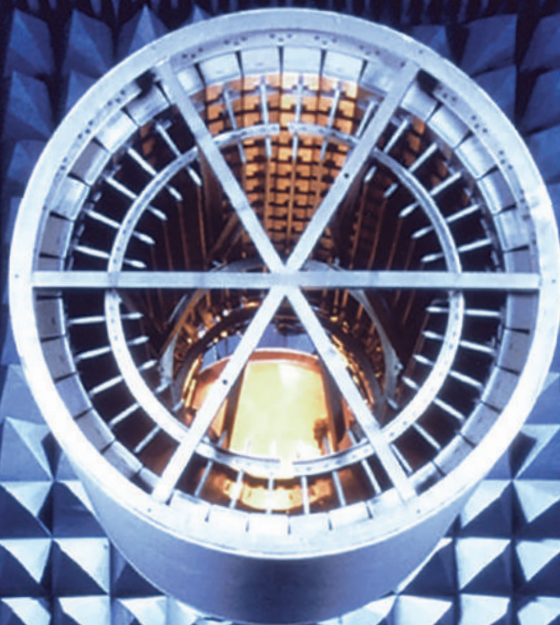
 **ETS·LINDGREN**<sup>®</sup>  
An ESCO Technologies Company

# ETS-LINDGREN IS AN EXPERIENCED PARTNER YOU CAN TRUST

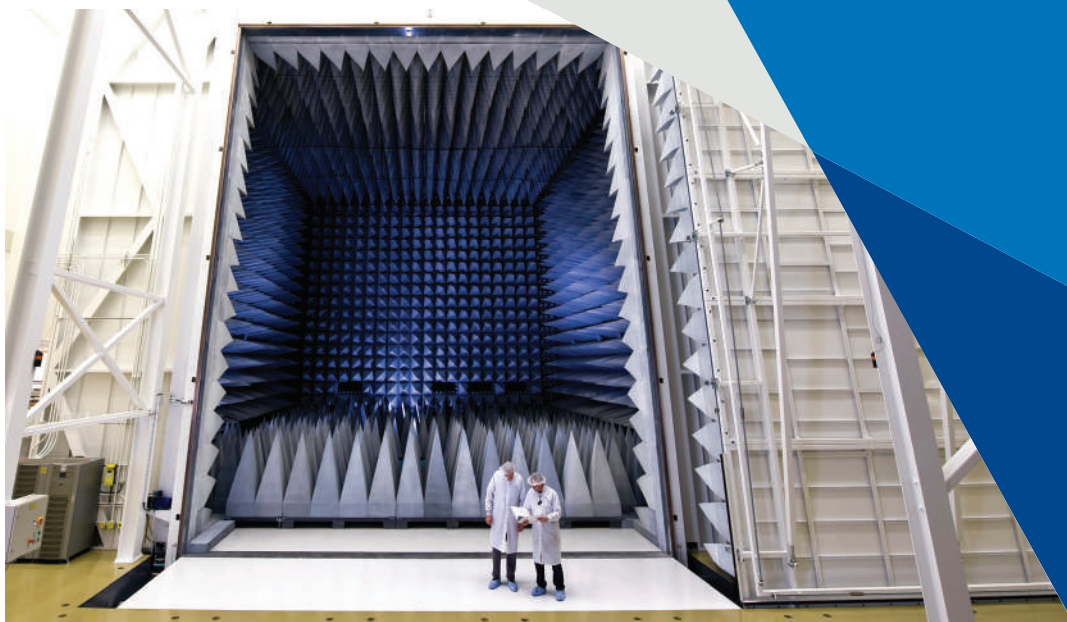
## RF MICROWAVE SOLUTIONS FROM THE LEADER IN TEST AND MEASUREMENT

ETS-Lindgren is the proven expert in the RF Microwave industry. With a turnkey system offering of chambers, antennas, absorbers, software, and service, backed by the experience earned with over 50,000 Radio Frequency (RF) shielded enclosure installations worldwide, ETS-Lindgren is well-known for innovative solutions, including numerous “Industry Firsts.” Our wide range of RF Microwave Solutions can be customized to meet the most challenging requirements for diverse test requirements, such as microwave and highly precise antenna measurements, mobile and satellite communications, over-the-air (OTA) characterization, and electromagnetic interference/electromagnetic compatibility (EMI/EMC) testing, to name a few.

Our ability to create real-world test environments enables our customers to verify, measure, isolate, contain, and ultimately bring life-changing products to their markets – faster. ETS-Lindgren also understands how downtime can impact our customers’ development, production, and testing schedules. As much as we’re recognized for our technology, innovation, and engineering capabilities, ETS-Lindgren is very much a people company. Around the globe, we are committed to collaborating with our customers and partners to deliver intelligent, innovative solutions, enabling our customers to deliver the next generation of products to market – ETS-Lindgren is *Committed to a Smarter, More Connected Future.*







## RF MICROWAVE PRODUCTS

### CHAMBERS

ETS-Lindgren's RF Microwave Chambers are absorber-lined, fully shielded rooms that are designed and constructed to provide a test environment free of electromagnetic interference, ensuring accurate measurements of your device under test (DUT).

Electromagnetic noise from computer monitors, mobile phones, televisions, radio towers, and other electronic sources, including the DUT itself, can interfere with measurements. Our absorber-lined and shielded chambers help reduce reflections to replicate a free-space environment ensuring quality measurements. ETS-Lindgren is committed to providing our customers with innovative, intelligent solutions addressing the latest test requirements, within our customers' space and budget parameters.

Our RF Microwave Chambers are designed to support many test applications such as:

- NF (Near-Field)
- FF (Far-Field)
- CATR (Compact Antenna Test Range)
- PIM (Passive Intermodulation)
- TAPERED (A specific chamber shape for very low frequency antenna measurements)
- GTEM (Gigahertz Transverse Electro Magnetic)
- EMI/EMC

Our chambers support a wide variety of development efforts including RF components, antennas, radars, and satellite systems, to name a few applications. For decades, ETS-Lindgren's full line of standard chambers have been developed and proven time and again in various testing applications. With customizable configurations, using our in-house certified Building Information Modeling (BIM) team, our larger chambers may be designed taking into account an existing parent building or seamlessly designed concurrently with a new parent building. From small to large chambers, from component level to full satellite DUTs, our chambers form the basis for your testing needs.

# RF MICROWAVE PRODUCTS (CONT.)

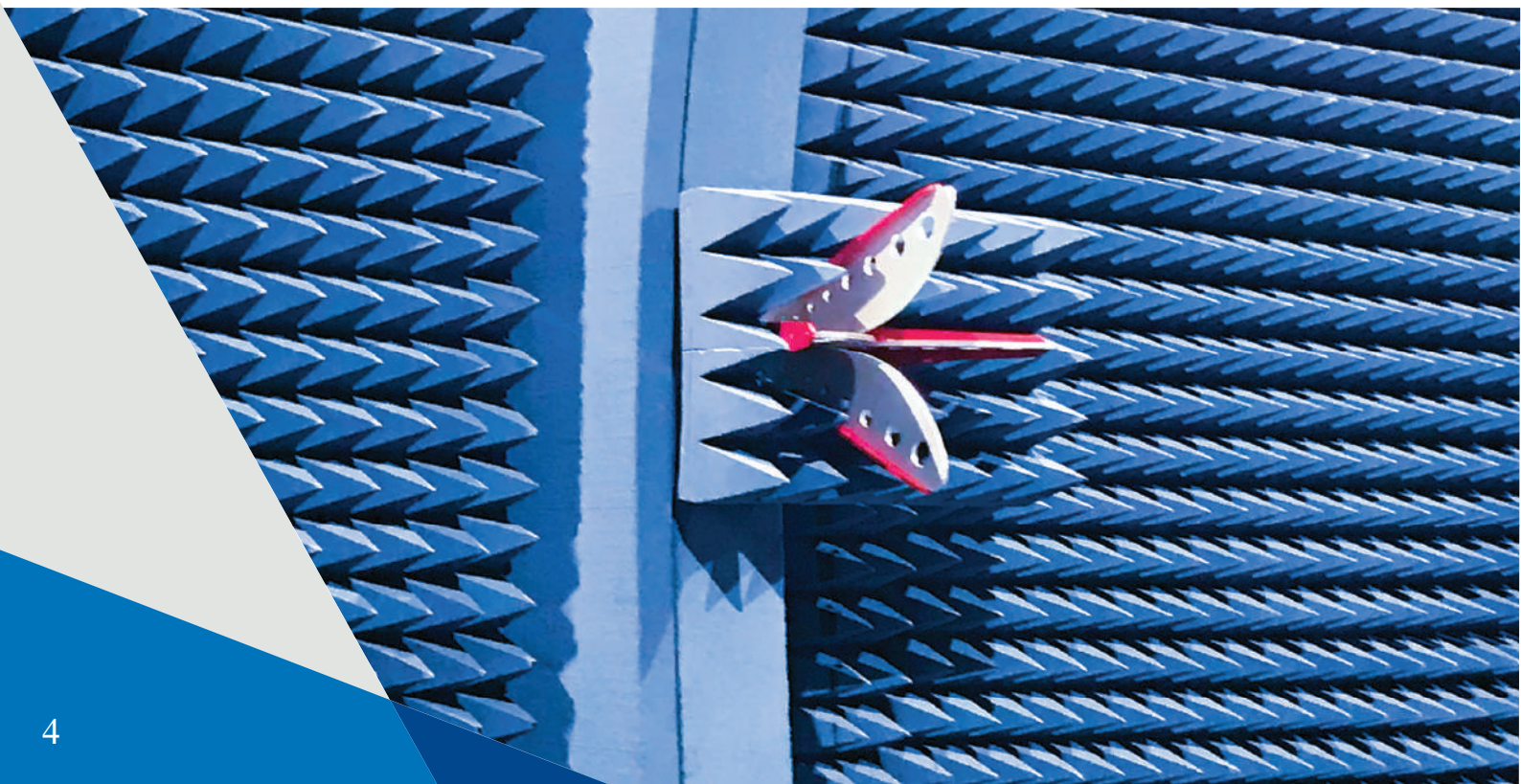
## ANTENNAS

ETS-Lindgren's antennas are designed with the latest computational modeling tools, manufactured with exacting precision, and individually tested to validate predicted performance. Whether you desire an antenna for EMC, Wireless, or RF Microwave applications, ETS-Lindgren's large selection of quality antennas are sure to meet your needs and exceed your expectations. For unique applications, customizable antennas are also available.

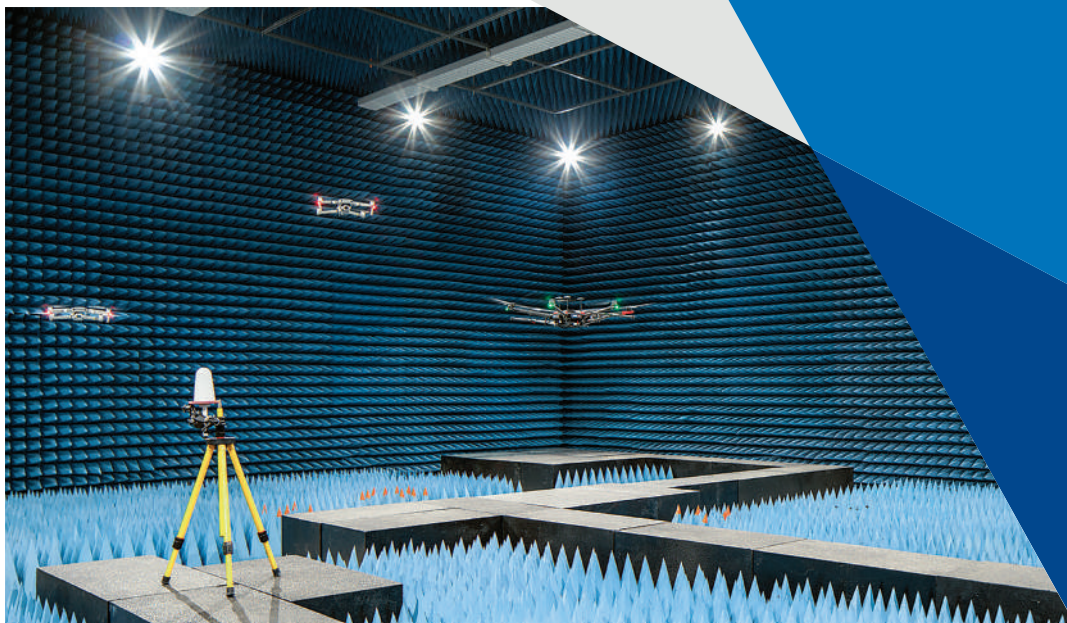
At ETS-Lindgren, we design and manufacture a variety of antennas including:

- Loop
- Monopole
- Biconical
- Log Periodic
- Conical Log Spiral
- Double-Ridged Guide Horn
- Open Boundary Quad-Ridged Horn
- Standard Gain Horn
- Octave Horn
- Field Generating
- Custom Antenna Design

ETS-Lindgren's A2LA-Accredited Calibration Laboratory (Lab Cert #1207.01) is equipped with calibrated instrumentation traceable to National Metrology Institutes (NMI), anechoic chambers, test cells, and an 80 m x 50 m (260 ft x 160 ft) Open Area Test Site (OATS). ETS-Lindgren can calibrate ALL brands of antennas and can often repair damaged antennas as required. All calibrations are accompanied with a signed certificate and can be supplied with antenna correction factors (where applicable) in electronic format.







## ABSORBER

ETS-Lindgren also manufactures RF Microwave Absorbers at our Durant, OK, USA, facility. We offer an extensive line of standard RF Microwave Absorbers, but also have the ability to create customized absorbers with special formulations, coatings, and physical geometries if desired to meet unique requirements. Using proprietary, advanced numerical modeling software, we develop our absorbers to ensure optimized design and formulation. Our absorbers are then prototyped and tested to validate the predicted results. Each piece of absorber is serialized and tested individually to maintain high quality.

Absorbers are provided in many different shapes and sizes; following are the most common absorbers we manufacture at ETS-Lindgren:

- EHP Series Polyurethane-Based Pyramidal Absorbers
- Filter Foam Series Absorbers (Reticulated Foam for air vents and other medium power applications)
- High Power Series Honeycomb Absorbers
- DuraSorb™ Series Polystyrene-Based Microwave Pyramidal Absorbers
- Convex™ Round Tip Absorbers
- Wedge Absorbers
- Walkway (Walk-On) Absorbers

ETS-Lindgren offers the largest selection of RF Microwave Absorbers in the world. Our RF Microwave Absorbers provide optimal electromagnetic attenuation across a wide bandwidth. Let our knowledgeable design and engineering team assist you in selecting the ideal product to fit your specific application.

Whether standard or customized absorbers, ETS-Lindgren delivers solutions quickly from our US-based manufacturing facility via our global sales teams and distributors located near you.

# RF MICROWAVE PRODUCTS (CONT.)

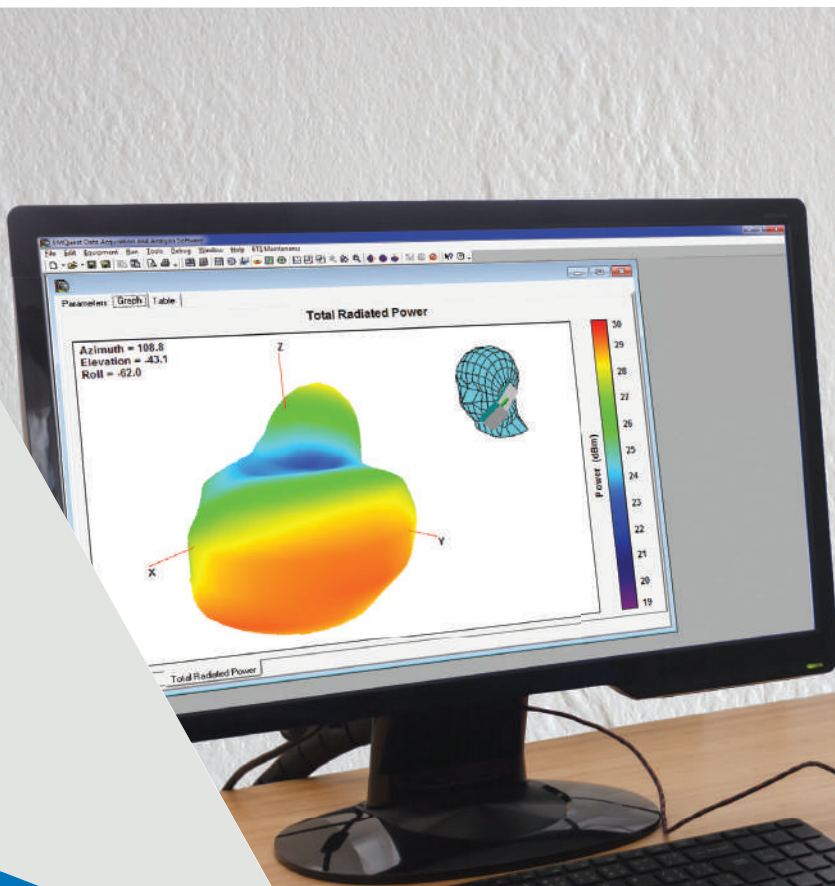
## SOFTWARE

ETS-Lindgren offers a variety of industry-leading software to maximize test efficiency, including EMQuest™ and TILE!™ (Totally Integrated Laboratory Environment).

ETS-Lindgren's EMQuest Antenna Measurement Software offers fully parameterized test methods for basic antenna performance metrics as well as testing radiated and conducted performance of various wireless devices. Whether you're designing antennas for stand-alone applications, or testing an embedded antenna system and radio module against any of the industry standard OTA requirements, EMQuest provides the flexibility to meet your testing needs.

TILE! software is an integrated test environment for creating and performing EMC tests. TILE! offers a library of profiles for testing to international test regulations for radiated emissions and radiated immunity (RE, RI) as well as conducted emissions and conducted immunity (CE, CI). Like EMQuest software, TILE! is hardware independent with driver support for most EMC instrumentation available today, with options to add drivers for new instruments in the future. TILE! is designed to perform EMC measurements in any test chamber environment.

ETS-Lindgren software maintenance contracts offer customers an extra level of support for their software needs, whether it involves driver development, new software release downloads, or even just a helping hand in getting the most out of your software investment.





## SERVICE SOLUTIONS

From education to consulting, product testing to calibration, ETS-Lindgren has dedicated experts committed to our customers' success. Let ETS-Lindgren assist you in maintaining your chambers and training your employees to ensure optimal utilization of your assets and avoid costly downtime. ETS-Lindgren employs more than 750 professionals at locations in the Americas, Europe, the Middle East, and Asia. In addition, we have a global network of independent representatives and distributors. Our customers benefit with local service and support from specialists who are backed by the global resources of ETS-Lindgren.

### FIELD SERVICES

ETS-Lindgren's Field Services consist of a global network of field installation teams and customer service personnel, available for on-location services. These services include chamber maintenance and repair, positioner maintenance and repair as well as on-site chamber testing and calibration. In addition to these field services, ETS-Lindgren can also help you move, upgrade, or refurbish your existing RF Microwave, EMC, and Wireless Chambers. This type of activity can often save you money and increase the return on your investment. Talk with our experts about how we can assist you in achieving your refurbishment/relocation project goals.

ETS-Lindgren also provides training for your employees. A training curriculum can be mutually developed in advance to provide hands-on training on new software or the latest updates to your existing software. Often this interactive training on ETS-Lindgren software – whether conducted remotely or on-site in your lab – expedites bringing your staff up to speed quickly in order to efficiently utilize your test chamber immediately upon completion.

### IN-HOUSE PRODUCT TESTING

Wireless product testing is available at ETS-Lindgren's corporate headquarters in Cedar Park, Texas. In 2002, we became the first CTIA Authorized Test Lab (CATL) for mobile station OTA performance testing – just one of our many "Industry First" accomplishments. We also offer A-GPS and MIMO testing.

*For detailed information on ETS-Lindgren's RF Microwave Solutions, please visit [www.ets-lindgren.com](http://www.ets-lindgren.com) or contact your local ETS-Lindgren representative.*



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