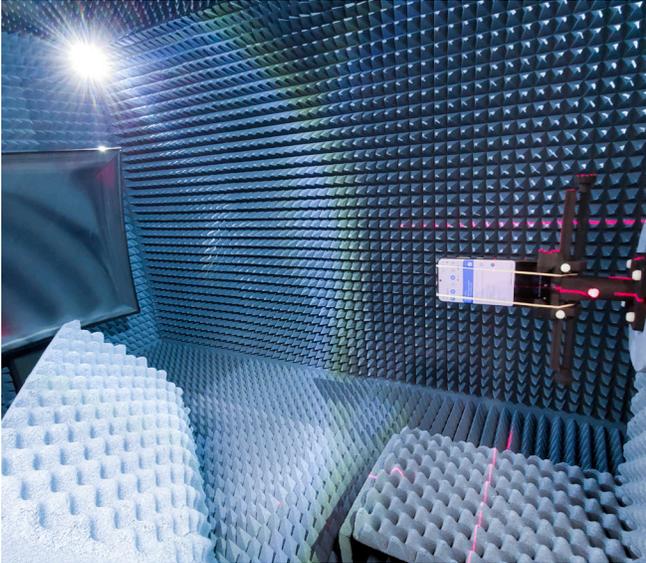


## CASE STUDY EUROFINS - SANTA CLARA, CALIFORNIA



As an international group of over 800 laboratories, Eurofins offers exceptional testing and support services to a global customer base. This includes the important Silicon Valley, home to many of the world's leading companies in the wireless industry. To expand their wireless test capabilities to meet growing customer demand in this area, Eurofins selected their trusted partner, ETS-Lindgren, to provide an AMS-5705 Compact Antenna Test Range (CATR). Model AMS-5705 enables over-the-air (OTA) radiated performance measurements for 5G New Radio (NR) devices in the FR2 frequency range of 24 GHz to 42 GHz in accordance with 3GPP TR 38.810. The new CATR complements Eurofins' existing chambers provided by ETS-Lindgren, Models AMS-8800 and AMS-8900, used for testing 5G NR wireless devices covering all FR1 frequency range designations from 410 MHz to 7.125 GHz.

Adding the AMS-5705 to Eurofins' suite of wireless test chambers was seamless since all chambers use ETS-Lindgren's industry-leading EMQuest™ software interface for FR1 and FR2 test requirements. The software is notably instrumentation brand-agnostic which provides Eurofins with tremendous flexibility to use various existing instruments as well as those procured in the future.

Now, with the FR1 and FR2 test capabilities, Eurofins offers a wide range of 5G NR wireless test services to its customers.

### AMS-5705 Overview

The RF shielded anechoic enclosure is compact and freestanding; this makes it ideal when space is limited. The portable chassis makes it an excellent choice for multiple research and development groups since it can be moved from one test group to another.

- The test system supports 5G NR testing of a wide range of portable wireless devices up to 30 cm in size.

- Designed for wireless device measurements including:
  - o Design validation
  - o Research and development
  - o Performance measurement
  - o Production sample testing

- Capable of making dual axis performance measurements for 5G NR mmWave devices per 3GPP TR 38.810 with or without antenna feed ports.

- Quiet Zone is a 30 cm diameter sphere.

- Positioner Accuracy is 0.05°.

- Resolution is 0.01°.

- Weight is 621 kg (1,380 lb).

### RF Shielding and Absorber

Model AMS-5705 is an RF shielded enclosure with nominal overall chamber dimensions of 2.67 m x 1.54 m x 1.97 m (8.9 ft x 5 ft x 6.5 ft). Accessories provided include:

- Chamber access door with nominal 71 cm x 135 cm (28 in x 53 in) clear opening and keyed access.

- Connector panels with 2.4 mm (.09 in) and SMA feed-thru connectors.

- LMF-4135 dual-line 2x10 Amp DC filter for AUT power and a USB filter.

- Model EHP-03PCL full absorber coverage on walls, ceiling, and floor with 7.6 cm (3 in) pyramidal microwave absorber.

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### Positioner

The feed antenna positioner includes a motorized horizontal translation stage and dual-polarized feed antenna for 24 GHz to 42 GHz measurements per 3GPP TR 38.310. The elevation and azimuth axis (E/Az) precision positioner provided includes:

- AUT mount with 10 kg (22 lb) load capacity.
- Integrated DC power for AUT.
- Integrated USB data connectivity for AUT.
- Manual horizontal translation stage.
- Two 50 GHz RF rotary joints with 2.4 mm connectors.

### Compact Range Reflector

The CATR corner fed reflector has nominal dimensions of 60 cm x 60 cm (24 in x 24 in).

### Chamber Accessories

Numerous chamber accessories were provided to create a turn-key wireless test system, including:

- Laser alignment system to assist with AUT alignment on the positioner with an internal switch.
- LED light sources with internal switch.
- Air vents covered with filter foam and an electric fan.
- Communication antenna for FR1.
- A 50 GHz RF switch platform including a seven-slot EMCenter™ modular RF platform and an EMSwitch™ RF switch 50 GHz plug-in card (4 x SPDT / 2.4 mm).
- Internal and external RF cables and integration components for rack integration.

- Control cables for the positioners.
- QoQz verification fixture per the 3GPP and CTIA

### Range Calibration Antennas and Mounting

ETS-Lindgren provided range calibration kits for the 3GPP measurements specified from 24 GHz to 42 GHz, including standard gain horn antennas and antenna mounts for the multi-axis positioning systems.

### Software Overview

Model AMS-5705 utilizes ETS-Lindgren's EMQuest EMQ-100 Antenna Measurement Software as its data acquisition and analysis package. Using EMQ-100, the system allows fully automated 2D and 3D pattern measurements. General post-processing capabilities include calculation of antenna properties such as half-power beam width, directivity, gain, radiation efficiency, total radiated power as well as various partial surface performance metrics required by the various OTA test requirements. Data can be exported to Microsoft® Excel and Adobe® PDF files or saved in a Microsoft® RTF format.

### Performance Validation

Performance validation was conducted by ETS-Lindgren. This included quiet zone performance validation per the procedures in 3GPP TR 38.810 at 24.25 GHz, 32 GHz, and 40 GHz.

### Integration and Training

ETS-Lindgren provided onsite integration services to educate and train Eurofins personnel on how to maximize their wireless test capabilities using the AMS-5705. The training services included:

- Integration of instrumentation in the delivered ETS-Lindgren rack system.
- Installation of the delivered cable assemblies and EMQ-100 software installation.
- Hands-on system and basic EMQ-100 software operation demonstration.
- Demonstration of the positioner and AUT mounting.
- Verification of system performance by conducting range calibration using provided range calibration antenna(s).
- Instruction during calibration on the creation of parameter files and usage thereof.
- Demonstration of antenna pattern measurements using a known passive antenna.

### About ETS-Lindgren

ETS-Lindgren is an international manufacturer of components and systems that measure, shield, and control electromagnetic and acoustic energy. The company's products are used for electromagnetic compatibility (EMC), microwave and wireless testing, electromagnetic field (EMF) measurement, radio frequency (RF) personal safety monitoring, magnetic resonance imaging (MRI), and control of acoustic environments.

Headquartered in Cedar Park, Texas, ETS-Lindgren has manufacturing facilities in North America, Europe, and Asia. Additional information about ETS-Lindgren is available at [www.ets-lindgren.com](http://www.ets-lindgren.com). Additional information about ETS-Lindgren's parent company ESCO and its subsidiaries is available at [www.escotechnologies.com](http://www.escotechnologies.com).



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