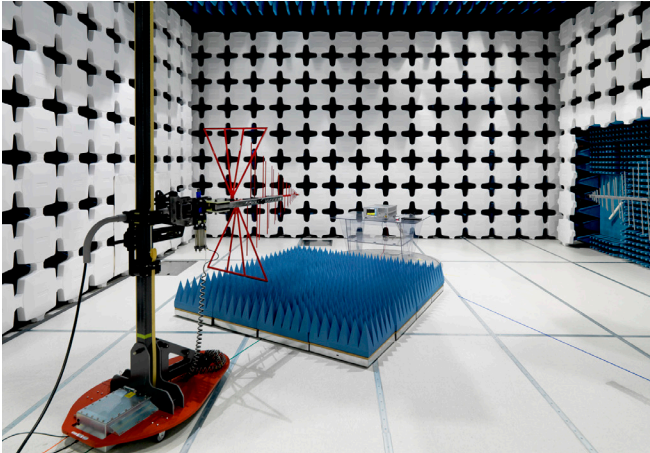


# EMC ANECHOIC CHAMBERS 5-METER CHAMBERS



ETS-Lindgren's FACT™ 5 Chambers offer semi-anechoic radiated emissions (RE) and fully anechoic radiated immunity (RI) compliance test capability for most international EMC compliance regulations. FACT 5 Chambers offer the ability to perform RE testing at a 5-meter distance while preserving the ability to perform full compliance testing of applicable 3-meter standards. Results obtained with 5-meter distance have better correlation to those obtained at a 10-meter distance than the ones measured at 3-meter distance.

## Performance

ETS-Lindgren FACT 5 chambers achieve their broadband performance using a unique arrangement of hybrid and ferrite tile absorber. The design was modeled using the proprietary numerical electromagnetic software responsible for creating chambers that set new standards for anechoic performance.

## MODEL FACT 5

- **26 MHz to 40 GHz Frequency Range**
- **Full Compliance Testing for Radiated Emissions:**
  - ANSI C63.4
  - FCC Parts 15 and 18
  - EN 50147-2
  - CISPR 11 / EN55011
  - CISPR 16 / EN55016
  - CISPR 22 / EN55022
  - CISPR 32 / EN55032
  - VCCI V-3 / 2003.04
  - SAE J551
  - SAE J1113
- **(Requires Chamber Modification to Accommodate Full Vehicle)**
- **Full Compliance Testing for Radiated Immunity:**
  - IEC 61000-4-3 / EN61000-4-3
  - SAE J551
  - SAE J1113
- **Eligible for FCC 3m Class B Facility Filing**
- **Available NSA Performance Options (May Require Chamber Modifications):**
  - Standard  $\pm 4.0$  dB
  - Standard Plus  $\pm 3.5$  dB
  - Premium  $\pm 3.0$  dB
- **Available as a Turnkey Package:**
  - Chamber
  - Tower
  - Turntable
  - Antennas
  - Instrumentation
  - Software

## Radiated Emissions Testing

ETS-Lindgren's FACT 5 chambers are designed to provide customers with more standardized solutions for different quiet zone diameters and performance options. This will provide users more flexibility to choose which solution works best for their individual needs. The available quiet zone sizes are available up to 3.0 meters in diameter.

ETS-Lindgren's FACT 5 chambers can be used to perform full compliance testing for ANSI C63.4, FCC Parts 15 and 18, EN 50147-2, CISPR 11 / EN 55011, CISPR 16 / EN55016, CISPR 22 / EN55022, CISPR 32 / EN55032, VCCI V-3/2003.04, SAE J551 and SAE J1113. ETS-Lindgren guarantees that the performance of Normalized Site Attenuation (NSA) testing according to ANSI C63.4 with 5-meter test distance, is  $\pm 4.0$  dB for STANDARD chamber,  $\pm 3.5$  dB for STANDARD PLUS chamber and  $\pm 3.0$  dB for PREMIUM chamber over the frequency range of 30 MHz to 1 GHz. The guaranteed performance for Site VSWR (sVSWR) test per CISPR 16-1-4 (ANSI C63.4) for frequency range of 1 GHz to 18 GHz is  $< 6.0$  dB, regardless which performance option is selected below 1 GHz.

## Radiated Immunity Testing

ETS-Lindgren's FACT 5 chambers can also be used to perform full compliance testing for IEC 61000-4-3/ EN61000-4-3, SAE J-551 requirements. At 3-meter test distance lengths, Field Uniformity (FU) of 0 - 6 dB can be achieved over the frequency range of 26 MHz to 18 GHz. The test aperture for FU is a vertical plane of 1.5 m x 1.5 m at an elevation of 0.8 m to 2.3 m above the ground plane, following the field uniformity test procedure of IEC 61000-4-3. Additionally, used absorber material can safely withstand continuous field intensity of up to 200 V/m and intermittent field intensity of up to 500 V/m. This safely exceeds the field intensity requirements of commercial RI tests.

## Optional Turnkey Systems

ETS-Lindgren can supply a fully integrated test system for your needs and with ETS-Lindgren, there's no need to deal with multiple vendors or incompatible hardware issues. With ETS-Lindgren, you work alongside a single, accountable partner with a proven track record of success. At systems level, our integrated RF measurement solutions are specifically designed to meet the requirements of a particular test standards. Our objective is always the same when we are designing the test system: listen carefully to our client's requirements, and then respond with proven solutions that minimize risk and assure success.

# EMC ANECHOIC CHAMBERS 5-METER CHAMBERS

## Baseline Configuration

- Design and Fabricate RF-shielded Enclosure
- Installation of the Enclosure and Absorber
- One Single-leaf, manually operated, RF-shielded Personnel Door
- Raised, Reflective Ground Plane
- Access Hatches in Raised Floor, Nominally 30 cm (12 in) x 30 cm (12 in)
- Waveguide Vents, Nominally 30 cm (12 in) x 30 cm (12 in)
- 50/60 Hz Power-line Filters for EUT, Lights, Antenna Tower and Turntable
- Connector Panels, Nominally 15 cm (6 in) x 60 cm (24 in) Clear Opening
- Pipe Penetration
- Fiber Optic ST-type Feed-through Kits for Antenna Tower and Turntable
- RF-shielded Penetration for Airline to Antenna Tower (Compressed Air is Responsibility of Customer)
- Corner-mounted Light Fixtures with Floodlights (Electrical Distribution not Included in All Markets)
- Shielding Effectiveness Test at 1 GHz with the Test Methods of MIL-STD-285/IEEE-299
- FerroSorb™ Hybrid Absorber
- Light Reflective Finish on the Walls and Ceiling
- FerroSorb™ Hybrid Floor Absorber on Sixteen (16) Movable Carts for Immunity Testing
- EHP™ Microwave Floor Absorber for an Area of the Floor for sVSWR Testing
- ETS-Lindgren Electrically Powered Turntable
- ETS-Lindgren Dual Device Controller
- ETS-Lindgren Bore-sight Antenna Tower; Electrically Powered and Air Polarization
- Warranty as per ETS-Lindgren's Standard Warranty for Anechoic Chambers and Associated Equipment

## Options

- Fully Integrated Test System to Meet the Requirements Of A Particular Test Standard
- Shielded Control Room
- Shielded Amplifier Room
- Model LDT-1.5 Low Dielectric Table
- 30 cm (12 in) and 45 cm (18 in) Raised Floors
- Low Profile Door Sill
- Sliding Door
- CCTV Monitoring System
- Intercom System
- Fire Detection And Suppression System
- Other Door Options Available
- Anti-static Vinyl Floor Tile
- Additional RF Filtering
- Company Logo Screen Printed Onto White Caps
- Immunity Interlock Switch
- Electrical Distribution
- Heating, Ventilation, And Air Conditioning (HVAC) System
- Seismic Structural Design Calculations And Certification

## Chamber Acceptance Testing Options

- FU Test per IEC 61000-4-3 From 80 MHz to 1 GHz
- FU Test per IEC 61000-4-3 From 1 GHz to 18 GHz
- NSA Test (3-meter) per ANSI C63.4/CISPR 16-1-4 From 30 MHz to 1 GHz
- NSA Test (5-meter) per ANSI C63.4/CISPR 16-1-4 From 30 MHz to 1 GHz
- sVSWR Test per CISPR 16-1-4/ANSI C63.4 From 1 GHz to 18 GHz

# EMC ANECHOIC CHAMBERS 5-METER CHAMBERS

## Technical Specifications

### Performance (2.0 Standard Plus)

Quiet Zone	2-meter
Normalized Site Attenuation (NSA) Performance	$\pm 3.5$ dB
Antenna Scan Limits	1 – 4 m
Site Voltage Standing Wave Ratio (sVSWR) Performance	< 6 dB
Field Uniformity (FU) Performance	0 to 6 dB (75% Points)

### Physical (2.0 Standard Plus)

Nominal Internal Shield Length <sup>1</sup>	10.7 m
	35.0 ft
Nominal Internal Shield Width <sup>1</sup>	6.7 m
	22.0 ft
Nominal Internal Shield Height <sup>1</sup>	5.8 m
	18.5 ft

### Performance (3.0 Standard Plus)

Normalized Site Attenuation (NSA) Performance	3-meter
Antenna Scan Limits	$\pm 3.5$ dB
Site Voltage Standing Wave Ratio (sVSWR) Performance	1 – 4 m
Field Uniformity (FU) Performance	0 to 6 dB (75% Points)

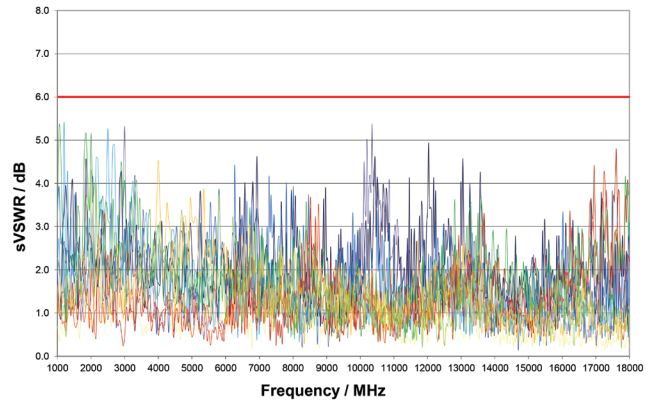
### Physical (3.0 Standard Plus)

Nominal Internal Shield Length <sup>1</sup>	11.6 m
	38.0 ft
Nominal Internal Shield Width <sup>1</sup>	7.3 m
	24.0 ft
Nominal Internal Shield Height <sup>1</sup>	7.3 m
	18.5 ft

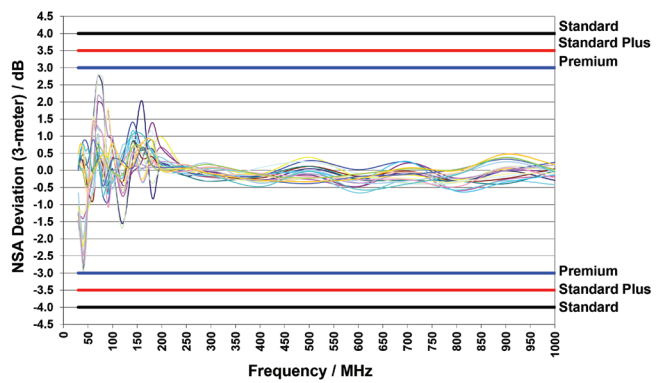
<sup>1</sup> Dimensions shown are typical. External dimensions will vary with shielding type and structural support requirements.

# EMC ANECHOIC CHAMBERS 5-METER CHAMBERS

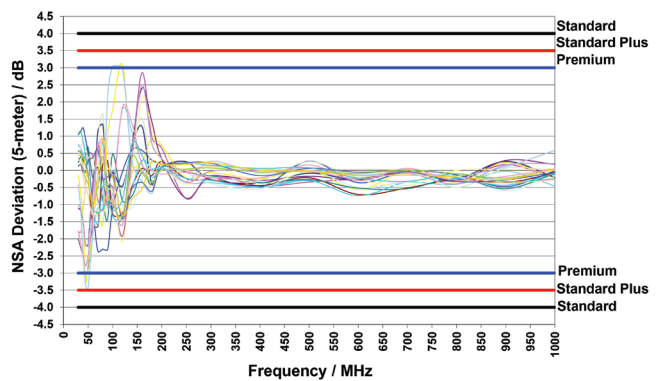
Measured sVSWR  
Deviation (3-meter),  
1 GHz to 18 GHz



Measured NSA  
Deviation (3m),  
30 MHz to 1 GHz

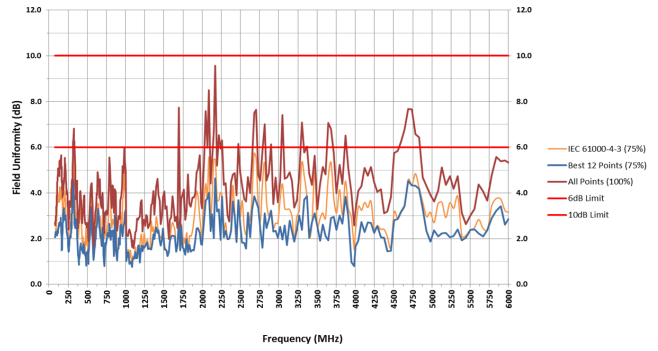


Measured NSA  
Deviation (5-meter),  
30 MHz to 1 GHz



# EMC ANECHOIC CHAMBERS 5-METER CHAMBERS

**Measured Field Uniformity (Horizontal)**



**Measured Field Uniformity (Vertical)**

