



Transverse Electro Magnetic (TEM) cell or Crawford cell (named after its inventor) is used to generate accurate electromagnetic waves over a wide frequency range: DC (0 Hz) to GHz. EM waves generated in the cell propagate in transverse mode and have the same characteristics as a plane wave. It can be used to calibrate E-field broadband probes for testing radiated E-field immunity as well as for measuring radiated emission from a product with a spectrum analyzer/EMI receiver.

TEM cell generates a consistent electromagnetic field for testing small RF devices such as wireless pagers, receivers, portable phones, etc. An external test signal applied through the input port of the TEM cell generates a consistent and predictable (plane wave) test field inside the TEM cell. The wave impedance is 377 Ω. The field conditions inside the cell are similar to far field conditions.

An optional filter box can be placed behind the cell for power and signal lines connections.

The radiation field emanating from a device (under test) located in the cell can also be detected through the signal generator port connected to an EMI receiver or a spectrum analyzer. The Equipment Under Test (EUT) is placed on the bottom ground plane as in Open Area Test Site (OATS) and in accordance with the shielded enclosure conditions.

TEM cells are used in final compliance certification tests. There IEC 61000-4-3 EMC standard, require a TEM cell for radiated susceptibility and radiated emission tests. Integrated Circuits (IC), Micro Electro-Mechanical Systems (MEMS) devices and PCBs can also be tested according to the standard SAE J1752-3. The closed TEM cells TEM200 and TEM500 are specially designed for the immunity tests on automotive devices according to ISO 11452-3 and to SAE J1113-24. TEM cells can deliver an equivalent OATS performance inside the comforts of a lab with minimum OATS errors. The main advantage of a TEM cell over a strip-line is that in the former, the EUT is completely shielded (except a window to insert/monitor the EUT) from the external environment, thus producing results with negligible errors.

It is one of the reasons why a TEM cell is qualified to perform final compliance tests.

| Technical Specifications | TEM 200 | TEM 500 | TEM 1000 | TEM 3000 |
|---------------------------|--------------------------------|---------------|----------------|----------------|
| Frequency range | DC-400 MHz | DC-500 MHz | DC-1GHz | DC-3GHz |
| Height under the plate | 30 cm | 10cm | 7,3cm | 2,35cm |
| Dimensions (LxWxH) | 130×70x62cm | 60×30x22cm | 54×45x18cm | 15×8x6cm |
| Max. Input power | 1,6KW long term | 1KW long term | 750W long term | 400W long term |
| Field for a 25W amplifier | 118V/m | 350V/m | 475V/m | 1,4KV/m |
| Impedance | 50 ohm | 50 ohm | 50 ohm | 50 ohm |
| VSWR | <1.1 | <1.1 | <1.2 | <1.2 |
| Return Loss | >25dB | >25dB | >20dB | >20dB |
| Connector type | N | N | N | N or TNC, SMA |
| Weight | Approx. 29Kg | Approx. 20Kg. | Approx. 4,8Kg. | Approx. 1,6Kg. |
| Options | Signal and power supply filter | | | |

* Can be equipped with a test setup for IC or PCB acc. to SAE J1752-3