

## EMC GTEM-400

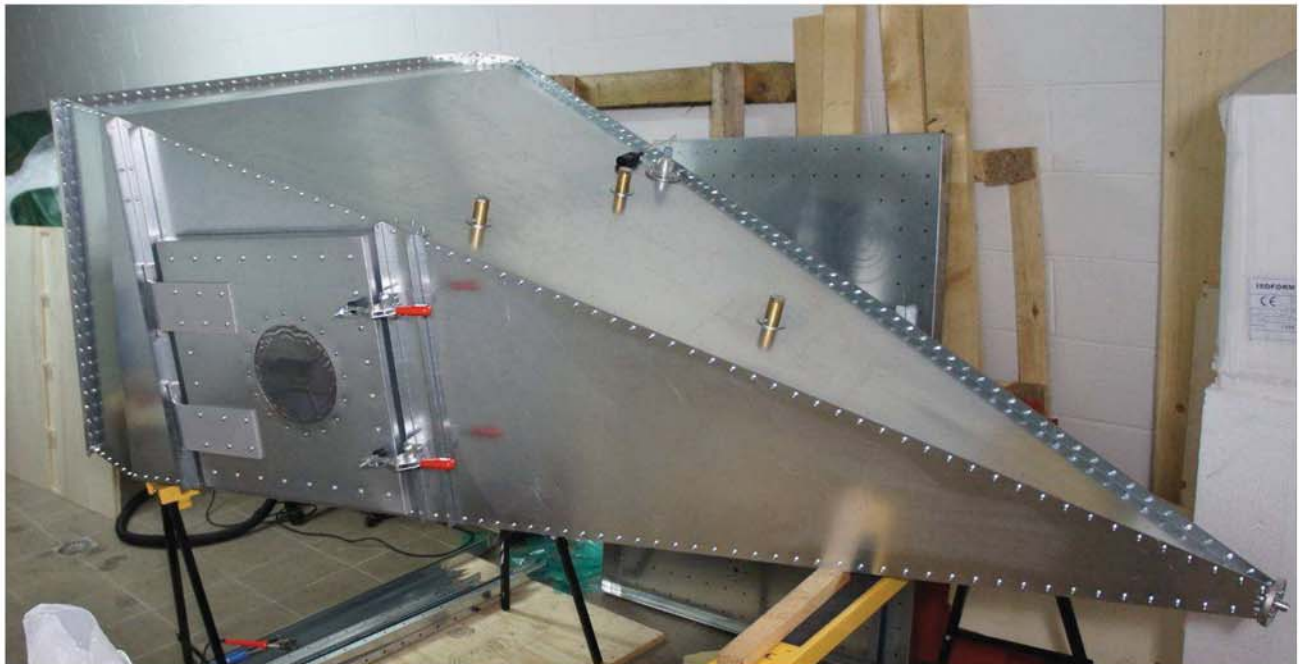
## Gtem Cell

### Introduction

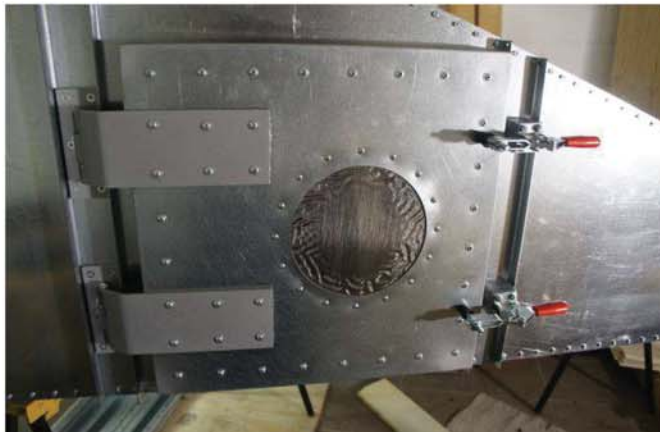
The GTEM cell is a TEM waveguide with the upper frequency limit extended to the GHz range.

It is a low-cost alternative measurement facility for both radiated emission and immunity measurements. It is included in the recently published standard IEC/EN 61000-4-20 "Emission and Immunity Testing in Transverse Electromagnetic (TEM) Waveguides". Compared to other measuring methods like EMC test in anechoic chambers or OATS (Open Area Test Sites), GTEM-cells offer some significant advantages for the testing of small and medium sized EUT's (Equipment Under Test) up to a frequency range of 20 GHz. Quick turnarounds of the EUT as well as numerous testing variations are easy and fast to handle. Switching from emission to immunity testing requires only simple adjustments from receiver input to amplifier output.

You are irrespective of long waiting times associated with off-site test labs or weather and ambient delays that can occur at OATS facilities. Whether you are at the design qualification, pre-compliance, compliance, or production sampling stage, the GTEM is the right choice for you!.

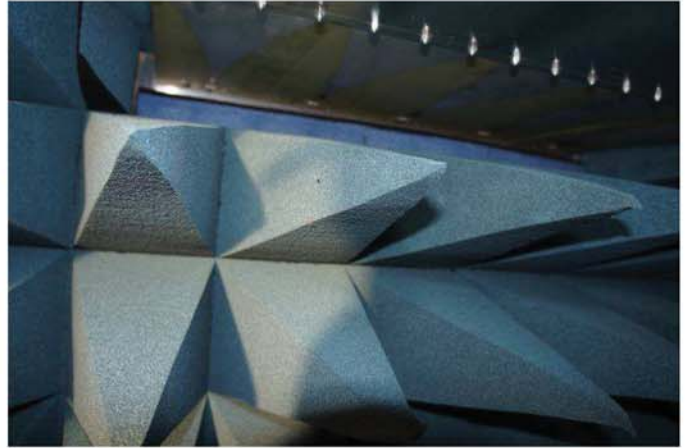


Gtem 400

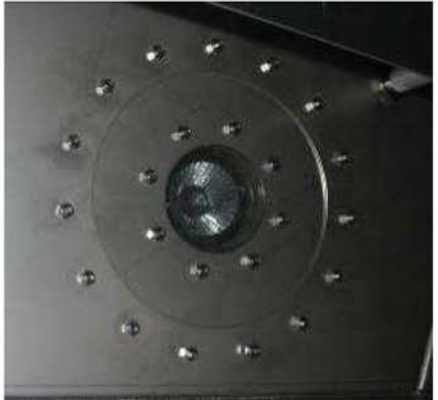
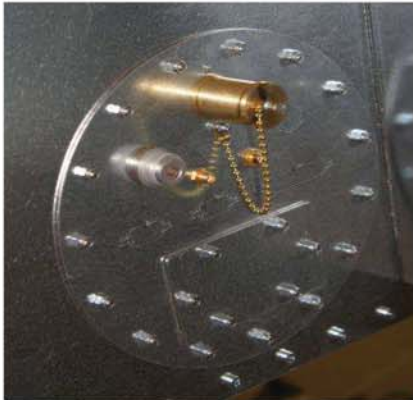


Reliant EMC is your top source for test equipment that enables you to reduce cost and time by self testing and certifying your products for Electromagnetic Compliance (EMC)

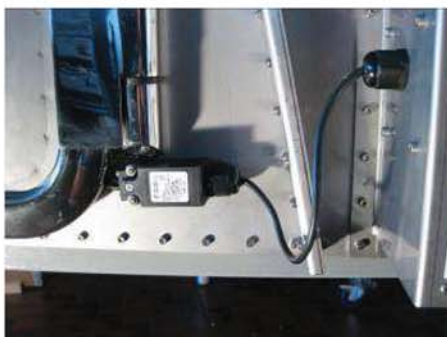
Reliant EMC LLC (408) 916-5750 Contact@ReliantEMC.com www.ReliantEMC.com



Rear and Internal views

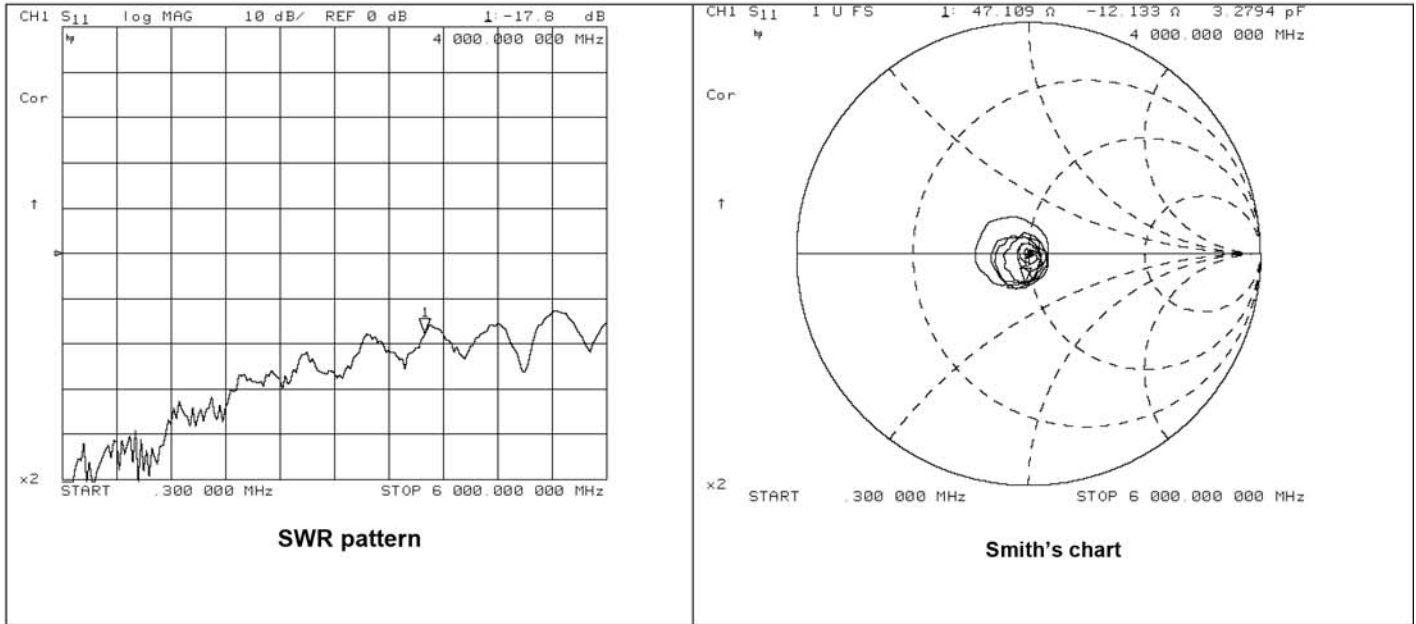


Technical panels - Windows - Light



Interlock - lamp - apex - internal sockets





### Key Features

- Engineered and completely manufactured Both in Italy and Brazil.
- Ruggedized fully Hot galvanized or INOX steel constructions
- Unique compact design.
- Optimized for EMI and EMC.
- Strong fields achieved with low input power
- Broadband up to 6GHz (up-gradable up to 20Ghz.)
- High effective shielding
- 2 poles 250Vac 50Hz 15A filter standard
- 2 poles DC 10A filter
- Excellent quality at Low cost

### Theory of operation

GTEM-cells (Giga-hertz Transversal Electro-Magnetic cells) are waveguide structures intended for electromagnetic compatibility measurements, as well as biomedical applications. The electromagnetic field distribution inside the cell is in TEM mode. With TEM mode propagation, there is no component of electric and magnetic field in the direction of propagation of electromagnetic wave. Therefore the field components are strictly perpendicular. Assuming the field distribution ideal TEM below the cut-off frequency of the cell (before the introduction of higher order modes), the electromagnetic field distribution can be considered static.

### Applications

- EMI and EMS devices
- Radiation and susceptibility test
- and dosimetrical applications
- Isotropic E-Field sensors and probes calibration
- Receiver sensitivity test
- Measurement of radiated power and sensitivity of wireless communication equipments

*Reliant EMC is your top source for test equipment that enables you to reduce cost and time by self testing and certifying your products for Electromagnetic Compliance (EMC)*

**Specifications \***

Operating range:	• 10KHz-20GHz
• Specifically designed for telecom application	
Biomedical RF Input	max continuous. input power: 500W RF R.M.S, 2KW Peak .
Input connector type	"N" UG-21 connector
Shielding:	better than 45 to 100dB depending from frequencies
Absorbers:	450 mm anechoic pyramidal foam
Outer cell dimension:	(L)2380x(W)1220x(H)830
Door Size:	40 x 40 cm
Construction	Fully Hot galvanized or inox steel 10/10 and 20/10 according with the choised option.

**Technical panel \***

**Power supply / Filter box - In and out. \***

N.1 Feed-thru "N-N" connector	N.1 15 Amp. 250VAC, 2 poles + Ground line filter
N.2 Feed-thru "SMA-SMA" connectors	N.1 10 Amp. 80V DC, 2 poles
N.1 multi holes feed-thru fibre optic penetration for 3 couples.	

**Options**

Inspection window with shielded polycarbonate glass 20 cm Diam.
Feed-trough panels, pipes connector
multi holes feed-thru fibre optic penetration for 3 or 6 couples.
N.1 filtered 10 poles connector 10A 600Vdc
N.3 filtered banana sockets 1A 1000Vac
Honeycomb air vents
Exhaust fan
TDK 6mm. ferrite tiles on the bottom

\* data are subject to variations without notice

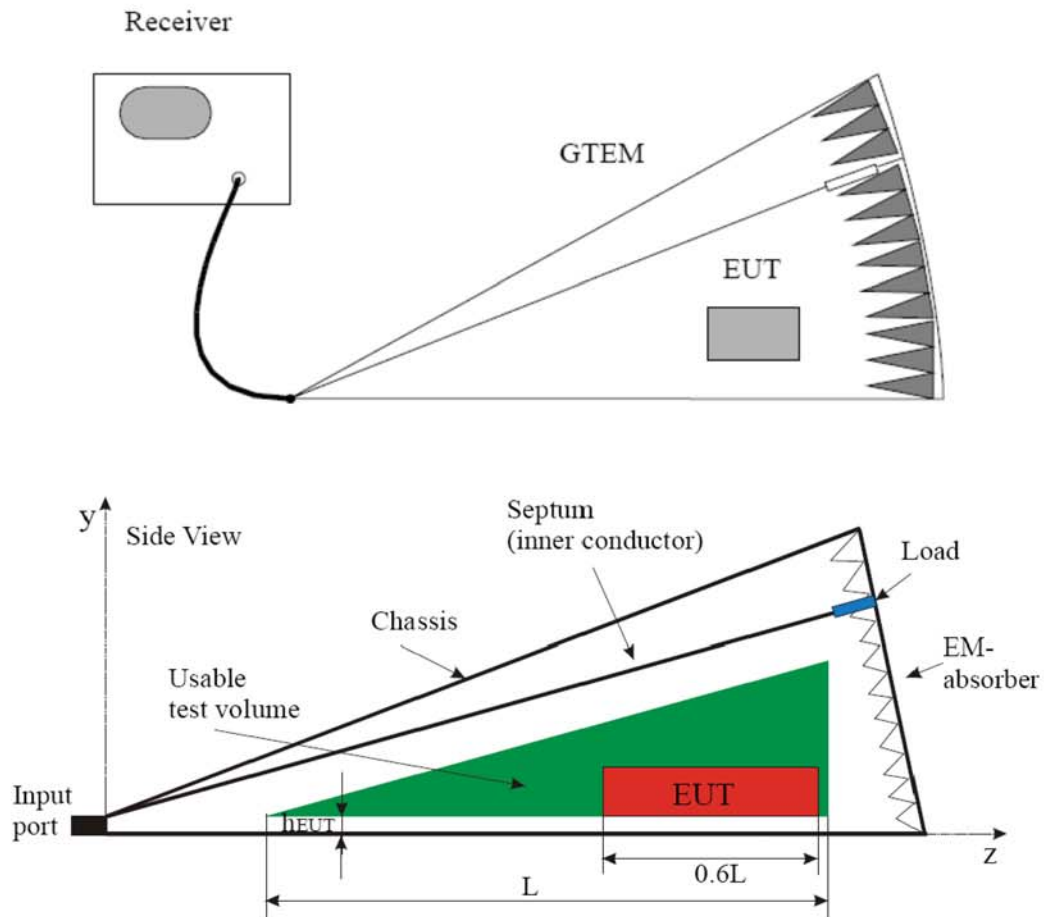
## Installation manual and general safety instructions

The GTEM (GigaHertz Transverse Electromagnetic) cell is a precision electromagnetic compatibility (EMC) test instrument primarily intended for use as radiated immunity and radiated emission test facility without environmental electromagnetic interference.

The cell is electrically similar to a coaxial cable with one side open (the apex) and other side closed on the impedance of the generator or receiver connected. In this case with a multi-meter appears as 50 Ohm resistance.

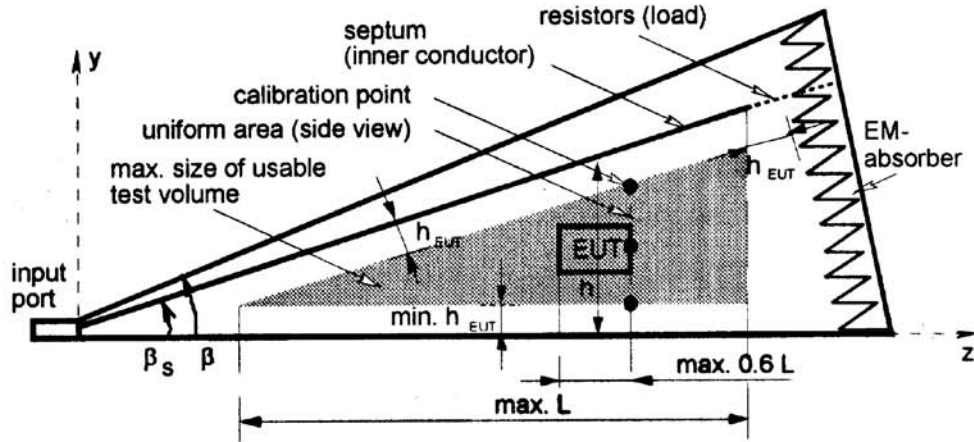
### Measurement setup

The setup for emission measurements in a GTEM cell is shown in Fig.1. the EUT is placed inside the GTEM and its radiation is measured with a receiver. The receiver can be software controlled, and some software that includes the GTEM to OATS correlation is commercially available.

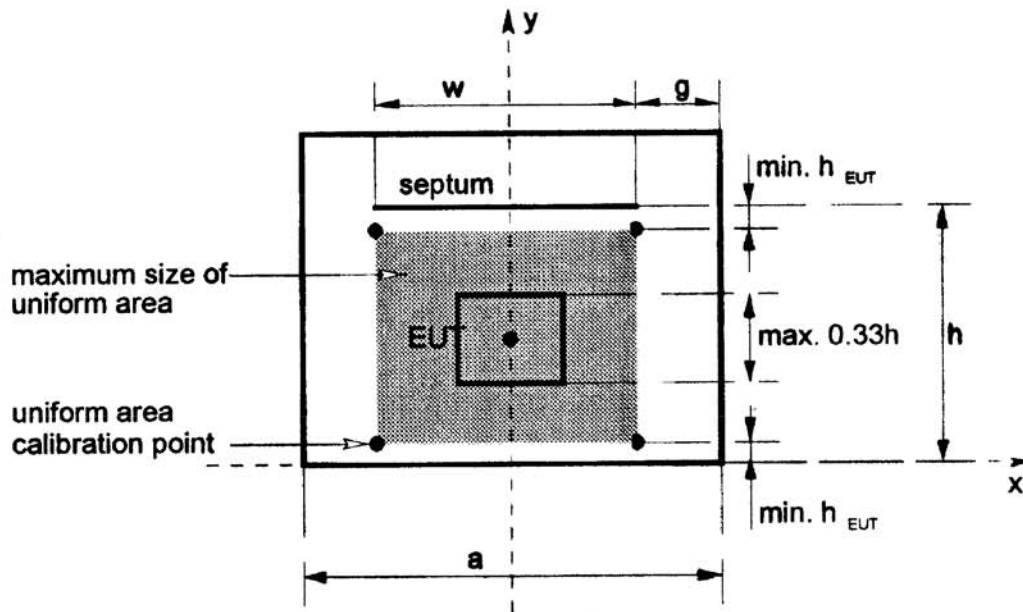




**TESTING VOLUME**



**Fig.2 - Maximum EUT size and maximum size of the usable test volume in a GTEM cell, longitudinal section**



**Fig.3 Maximum EUT size and maximum size of the usable test volume in a GTEM cell, cross section**

## Instructions



The cell is made to work in Horizontal position.  
The Input port N connector at the top of the pyramid is very delicate: please take care avoiding to break the internal pin. For frequent use leave a coax cable in a stable connection.  
The internal coaxial semi-rigid cable require care during handle, don't make torsion or fold too much .  
The filter and the technical panel units contents feed-trough connections Pin-to-pin to supply EUT (Equipments under test) with AC or DC source or I/O connection. Please refer to the max limit stated in the specification section.  
Don't apply over currents and over-voltage.



The unit must be separately earthed, or connected to an AC main source with a hearth connection.  
Possibly supply energy from a tapes source equipped with earth connection and differential magneto- thermic protection switch



During immunity test, Don't leave open door, Radio frequency could interfere with civil communications. Long term Expositions at High RF levels could be dangerous for the health.



Maintenance require periodically check of the gaskets and the lock system. Don't apply strong pressure on to the gaskets. Leave the door open when the cell is stored for a long time, it preserve the gaskets. Keep clean the internal ambient of the cell from the carbon residual, it could cause short circuit in the E.U.T. and between the connections! If necessary help you with an air vacuum cleaner.

For any trouble feel free to contact us at: [emctest@gmail.com](mailto:emctest@gmail.com)

## Maintenance

*Reliant EMC is your top source for test equipment that enables you to reduce cost and time by self testing and certifying your products for Electromagnetic Compliance (EMC)*

Reliant EMC LLC (408) 916-5750 [Contact@ReliantEMC.com](mailto>Contact@ReliantEMC.com) [www.ReliantEMC.com](http://www.ReliantEMC.com)

- When you are not operating live partially closed the door avoiding to stress too much the gasket (they could take the “form” reducing the shielding properties ).
- Avoid to touch with the fingers the anechoic pyramids they could damage easily.
- Take care at the N input connector, do not remove the protection angle adaptor, If damage occurs replace urgently the adaptor with one similar: straight or angular just to save the remaining connector .
- For cleaning purposes remove before any power supply source from the GTEM cell, Then use only water added with soft detergent for the window, avoiding aggressive products: they can damage the meta-acrylate glass.
- Periodically remove dust inside the cell with a vacuum cleaner

### Troubleshooting

- **No power supply:** Magneto-thermall switch OFF, or OVERLOAD: reduce the load.
- **No field with RF power applied:** pin of the coaxial connector broken. Check and refer to the assistance.

### Additional info

- **Power supply:** when necessary connect the AC 230V power cord only to tapes with differential switch and magneto-thermal switch.
- **Load:** Do not apply over load to the line filter: remember the max. load is 16A max. 250Vac for the plug and 10Amps max. 80Vdc for the banana jacks,
- **Ground:** A ground connection is necessary for your safety. Connect permanently the ground screw placed nearby the filter box at the your building earth system with a 16mm<sup>2</sup>. If not provided: connect to a screw of the chassy. Verify periodically the status of the connection . Remember that the metallic structure is conductive
- **Door:** During immunity test the door has to stay closed. If necessary could remain also opened: the field losses are negligible and result of pre-compliance test does not suffer too much.
- **Additional holes:** Make only on the technical panel ( remove it if necessary)
- **RF Power input:** No care necessary: the termination is over sized (the limit of the components is 500W when normally cooled and operating temperature can rise up to 100°C).

### Warranty

- All the parts are covered from guarantee for a period of 1 year except ones subject to normal consumption as: gasket, coaxial type N or SMA connectors, anechoic pyramids.
- In case you discover defective parts please enter in contact through email:  
[gtem.cell@gmail.com](mailto:gtem.cell@gmail.com)



### **Assistance**

- Refer to our local dealer or contact us sending a mail at: gtem.cell@gmail.com

## **- WARNINGS! READ BEFORE USING**

### **HANDLE CAREFULLY**

- The GTem cell is a professional test equipment intended for EMC emissions and immunity test purposes operated by trained personnel. Some care is necessary:
- don't take the apex to move the cell, push or pull from the frame trolley, before move the cell, loosen the fixing screws and than tight again.
- Open or close the door softly.
- Insert always straight the N and SMA connectors, don't tight too much, it is not necessary!.
- One N type corner adaptor connector is suggested to protect the apex, please don't remove it. In case of break contact the assistance.

### **RADIO FREQUENCY RADIATION**

Personnel should not be exposed to the microwave energy which may radiate from this device. All inputs or output RF connection gaskets must be leak proof. Never look inside or leave doors open when this device is energized!.

### **ELECTROMAGNETIC FIELD**

Strong RF levels may cause de-magnetization and interference to others services. Operate always with the door closed and keep far from sensitive devices.

### **SHOCK HAZARD**

Accidental short circuit or leakage current may occurs: Supply the unit through magneto-thermal differential switches lines. Keep always the GTem cell grounded also with power supply disconnected. During normal tests operation connect energy only with the door closed.

### **ELECTROSTATIC DISCHARGE**

To avoid ESD keep always the GTem cell grounded fitted with a permanent earth 16 mmq. wire conductor.

### **DANGER**

Risk of injury at hands and head or cuts around the metallic surfaces of the chamber may occurs. Leave around the cell a free area from obstacles.

### **MAINTENANCE**

Verify periodically:

- the status of the door gasket,
- I/O connectors integrity.
- Oil the wheels of the trolley and the door hinges.

Clean inside the chamber excess of dust with a vacuum cleaner.

Protect metallic surfaces against corrosion, cleaning with a soft cloth wet of Vaseline, Silicon or Parafine oils. Avoid cleaning with water based products or chlorine solutions!