European EMC Products Ltd

MRI MEDICAL SHIELDED ROOMS

EEP

Designers & Installers of MRI Rooms • Faraday Cages
Magnetic Field & Ionising Radiation Shielding • Quench Pipes
MRI Shielded Doors & Windows • MRI Lighting
Power Filters • Picture Virtual Skylites • RF Testing

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CYBER ESSENTIALS CERTIFIED PLUS

bsi ISO 9001 Quality Management Systems CERTIFIED
Certificate No. FS38901

Constructionline Gold Member

JOSCAR REGISTERED

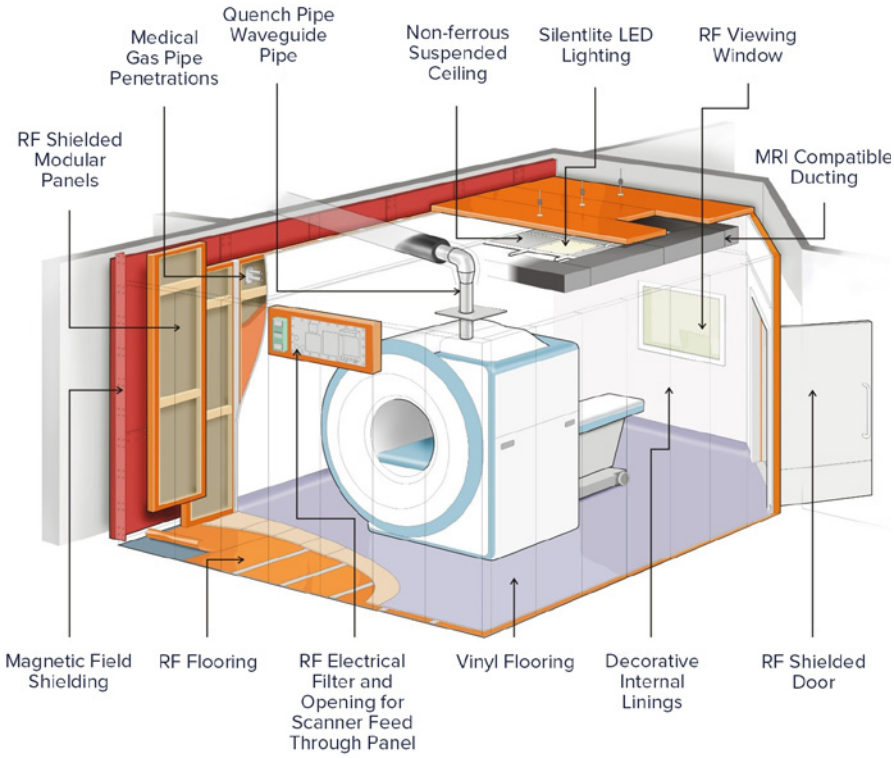
MRI MEDICAL SHIELDED ROOMS

From initial design consultation through to completion European EMC Products (EEP) offer a complete MRI Solution.

EEP provide Radio Frequency (RF) shielding for MRI examination rooms in the form of a faraday cage. These faraday cages cover the requirements of all the major MRI scanner manufacturers such as Siemens, Philips Medical, General Electric and Toshiba.

MRI scanners are placed inside a Radio Frequency (RF) Shielded Room to prevent external interference affecting the final images.

All MRI shielded rooms are RF Tested on completion to standard IEEE 299 Standard Method for Measuring the Effectiveness of Electromagnetic Shielding Enclosures.

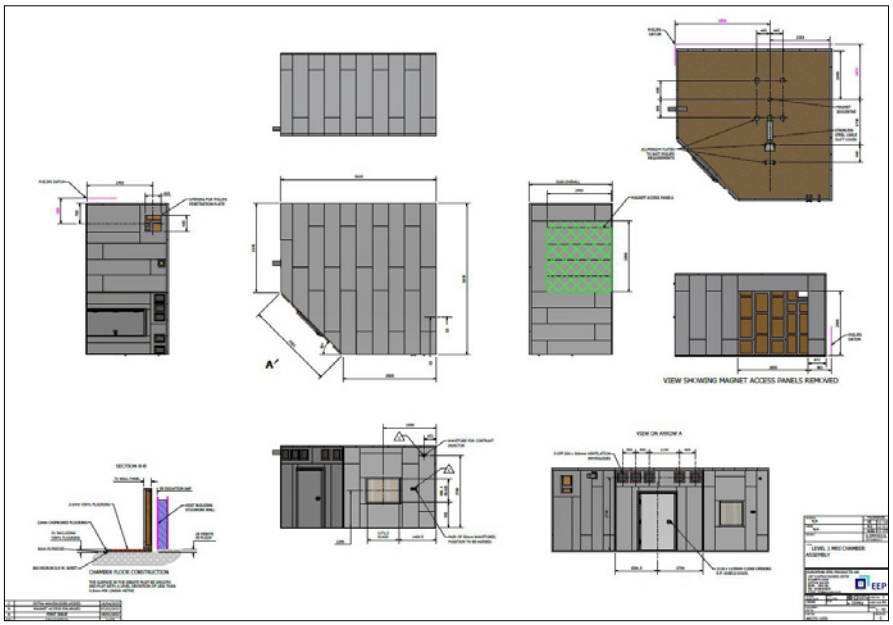


IN-HOUSE DESIGN

No two rooms are the same!

EEP have over 25 years of experience designing and installing MRI rooms. From either construction drawings or a site inspection, EEP design team will create the faraday cage to suit your host room. Drawings will show details of the faraday cage structure, door & window positions, ceilings, filters, penetrations & room finishes.

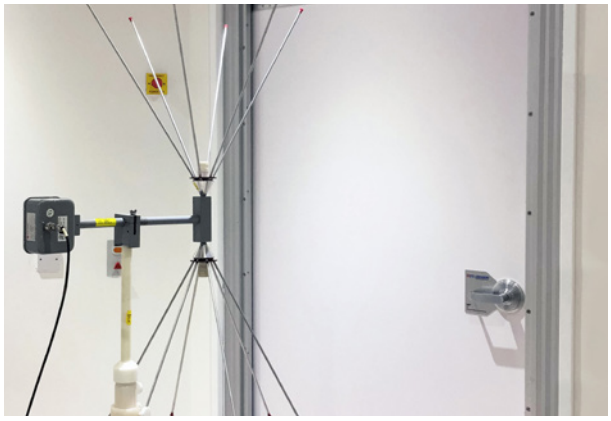
Once design drawings have customer approval, EEP commence manufacture of the faraday cage ready to meet your pre-determined installation date.



MRI FARADAY CAGE

When creating an RF shielded room, EEP construct a faraday cage using copper clad panels. Acoustic insulation is fitted and the necessary electrical power and data cabling is installed along with various services, all of which are shielded using suitable filters.

A breakout area of any wall or roof area can be incorporated for ease of magnet delivery or removal.



MRI ROOM DOOR

The MRI shielded door is an important part of any MRI shielded room, therefore the design and quality of the construction is essential.

MRI shielded doors reduce the electronic interference, as well as operating as an acoustic door. The doors can be manufactured to be manually or pneumatically operated with varying acoustic requirements.

MRI ROOM WINDOW

Being able to see a patient during an MRI scan is important both for the clinical staff and for the patient. As well as needing good visibility, the MRI window must offer the same level of shielding as the rest of the faraday cage.

The EEP window has two layers of blackened mesh to meet the RF performance. These must be positioned at a precise angle to each other to prevent visual distortion called fresnel interference. EEP can supply windows of varying sizes and frame designs.

MRI INTERNAL FINISHING

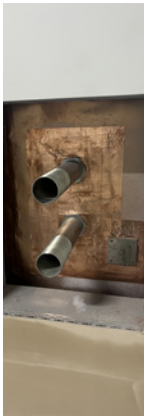
Once the faraday cage is complete EEP can offer the follow internal finishes:

- Internal Wall cladding either using High Pressure Laminated Wall Panels (HPL) or wall board and plastic finishes.
- Non-ferrous suspended ceiling installation populated with high grade commercial ceiling tiles.
- Choice of flooring from medical grade commercial vinyl.
- Flooring to include welded seams and cap and cove around perimeter.
- Internal decoration, where necessary, to match surrounding areas.

WAVEGUIDES & PENETRATIONS

EEP design, manufacture and install a wide range of RF (radio frequency) shielded waveguides and penetrations which include medical gases pipework, fibre optic pipe penetrations, gas & water pipes and air conditioning ducts.

Fibre optic cables or gases can be fed through dielectric material penetrations without degrading the performance of a shielded room.



MRI MAGNETIC FIELD SHIELDING

Shielding against magnetic fields is crucial in any MRI installation for the safety of people, the MRI scanner itself and other medical equipment in the surrounding area.

Magnetic fields are generated by permanent magnets, electromagnets, electric motors, electrical distribution systems and MRI scanners. When these magnetic fields need to be contained or controlled, EEP can design and install shielding.

Shielding against magnetic fields created by MRI scanners is extremely important to ensure that:

- MRI scanners are unaffected by nearby ferrous masses (e.g. lifts or vehicles).
- Medical equipment in an adjacent area can function without interference.
- Shielding ensures that a safe environment is created for people fitted with electronic implants such as a pacemaker.

Prior to commencing the full design and installation of the physical magnetic field shielding, EEP can also plot the magnetic lines of force to verify where the magnetic field strength is located.

MRI QUENCH PIPES

At EEP we are well versed with the cryogenic engineering practices required to cope with the physical impact on the MRI quench pipe system that a helium discharge produces.

Helium quench pipes form a crucial part of any super conducting MRI scanner installation. In an emergency, the potentially lethal gaseous liquid helium used in the scanner must be vented directly and safely into the atmosphere, therefore it is paramount the quench pipe system withstands the drastic shift in temperature from ambient to that of liquid helium (-269°C / 4° Kelvin) within seconds. All our installations adhere to stringent installation standards.

MRI LIGHTING – SILENTLITE®

The Silentlite® lighting system is a complete MRI lighting solution. The controller contains the power supply unit, control boards, back up batteries and RF filters. It is mounted on the outside of the faraday cage. All connections are filtered, therefore no radio frequency interference is induced, conducted, or radiated into the chamber.

Silentlite® produces virtually no electromagnetic emissions and consumes just 25% of the power of halogen lighting, helping reduce energy costs. The LED panels are extremely lightweight and fits within a standard 600mm x 600mm ceiling grid for easy installation.

MRI LIGHTING – SILENTLITE® VIRTUAL SKYLITES

Silentlite® virtual skylites and virtual wall panels are a high-definition image, MRI compatible, decorative LED panel mood lighting system.

The LED picture panels are positioned ideally to provide a focal point for the patient and their aim is to assist in creating a more calming and relaxing environment whilst they undergo their scan. The picture ceiling also aids in making the room feel less clinical.

Our Virtual Skylights are not solely for use in MRI rooms. Both ceiling and wall panels can be manufactured for use in a variety of healthcare facilities/areas such as X-Ray Rooms, CT Rooms, Dental Practices, Clinics and Consulting Rooms. They can be fitted as a standalone product against an existing lighting system.

MRI POWER, CONTROL SIGNAL & DATALINE FILTERS

Power Line Filterscan be used to supply power to the entire MRI room, providing shielding effectiveness within the room itself. Power line filters for MRI rooms range from 5A to 63A and are required to protect equipment within a shielded area from the damaging and disrupting effects of electromagnetic signals.

Control Signal Line Filters can be used to supply power to instruments and equipment within a shielded environment. These filters suppress the electrical noise outputted by various connected electrical equipment at high frequencies, helping towards reducing the total amount of electrical noise within the shielded environment. Control line filters are available from 2 to 12 line.

Dataline Filters can be used with equipment such as nurse call systems. Our Dataline filter conforms to all MRI shielding requirements and allows the scanning nurse to be alerted from inside the MRI room.

MRI ROOM RF TESTING & MAINTENANCE

On completion of an MRI room, EEP conduct a full RF test of the room to ensure conformance. To improve longevity of MRI Rooms it is recommended to conduct regular maintenance of the MRI room. EEP can offer maintenance and servicing contracts to suit.

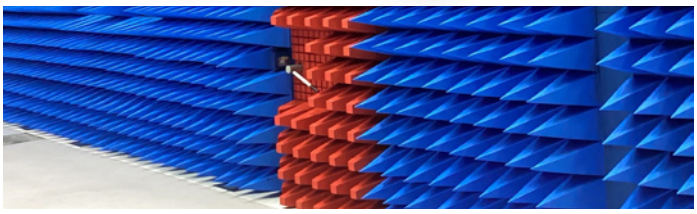
About Us

Established in 1996, European EMC Products Ltd (EEP) are an established British company whose experience and understanding of the science of shielding makes it an ideal partner in whom you can place your trust with confidence.

The purpose of installing EEP shielding systems is to protect people and equipment against the threats posed by electromagnetic and radio frequency (RF) interference, radiation, magnetic fields and electromagnetic pulses. Our diverse range of turnkey products and services, including design, installation, project management, testing and consultancy are delivered across multiple sectors to an international client base.

Security Doors

Sound Masking



Anechoic Chamber

EMP Power Filters

European EMC Products Ltd (EEP) are registered to BS EN ISO 9001:2015, Certificate Number FS38901, specialising in the design, manufacture and installation of RF Shielded Structures, Blast Doors, Gas Tight Doors, Electromatic Pulse Protection (EMPP) containers, Magnetic Shields, Quench Systems for MRI Scanners, LED Lighting Systems for Medical Applications, Sound Masking and Eavesdropping Protection Systems, Power and Signal Filters.

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