Shwehna Group
Healthcare

MRI RF Shielding & Complete Room Solutions

RF shielded cabins • RF doors and windows • Quench pipe coordination • MRI-compatible lighting • Power and signal filters • Waveguides and penetrations • RF testing and maintenance support

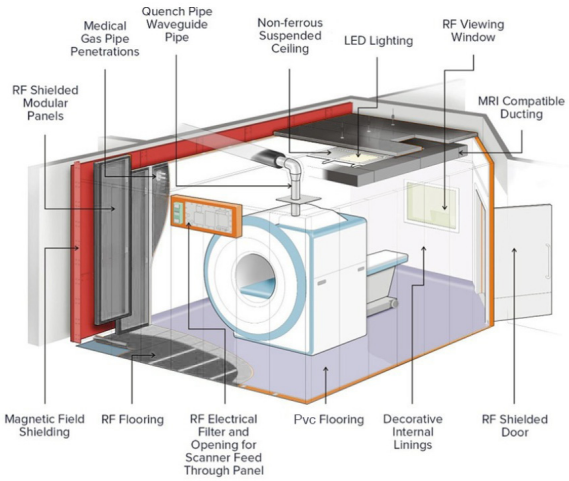
MRI RF Shielded Cabins | **Faraday Cage Systems** | **Room Components** | **Project Coordination**

This brochure has been prepared for Shwehna Group as a professional healthcare RF shielding profile for MRI room projects. Images are used as technical illustrations and can be replaced with project-specific visuals when required.

MRI RF Shielded Cabin System

High electromagnetic shielding performance, structural durability, and long service life for MRI environments.

Shwehna Group provides project-based RF shielded cabin systems for hospitals, medical imaging centers, contractors, and medical equipment providers. The system is intended to protect MRI rooms from external radio frequency interference and to support stable imaging performance through a continuous shielded enclosure.



Panel Structure and Material Specifications

The cabin can be produced using a composite sandwich panel structure manufactured by pressing 0.7 mm special galvanized steel sheets on both sides of 18 mm MDF boards. This structure supports long-term durability, mechanical rigidity, and high electromagnetic attenuation performance.

Structural Advantages

- Surface rigidity and torsional resistance
- High impact strength and deflection resistance over long spans
- Long-term protection against corrosion and deformation
- Balanced strength in all directions due to symmetric galvanized layers

Electromagnetic Performance - IEEE 299 Aligned

- Magnetic shielding attenuation: > 100 dB (1 - 30 MHz)
- Electric field attenuation: > 100 dB (30 - 160 MHz)
- Insulation resistance between shield and ground: > 3 kΩ

Acoustic and Mechanical Properties

Acoustic / Floor System

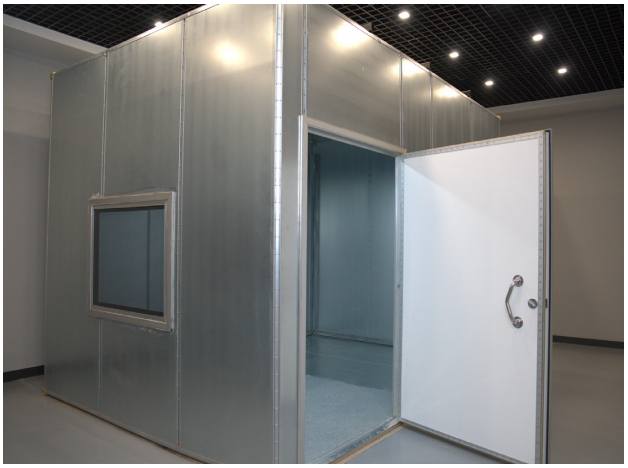
- Sound insulation: > 44 dB(A)
- Floor insulation: 3 mm membrane + underlayer isolation material
- Integrated baseplate manufacturing and floor connection
- Acoustic comfort for a quieter MRI room environment

Design and Modularity

- Modular and flexible design adaptable to different room sizes and site conditions
- Fast installation and disassembly
- Easy maintenance through replaceable components
- Suitable for new MRI installations and room upgrade projects

RF Room Equipment and Integration

A complete MRI RF cabin requires coordinated integration of doors, windows, filters, ventilation, penetrations, lighting, and site preparation components without compromising shielding continuity.



Integrated Components

- RF door: standard clear opening 1.20 x 2.10 m; manual or pneumatic options; custom sizes available
- RF window: 100 x 120 cm; custom sizes available
- Magnetic door switch system
- RF EMI filters: 16 A, 25 A, 50 A
- EMI/RFI shielded waveguide air vents

Site Interfaces

- Quench duct integration
- Filter panel openings and cable pass-through adapters
- Stainless steel pipes Ø5 cm and Ø7 cm for medical gas lines and injector cable entries
- MRI-compatible LED lighting: 600 x 600 mm panel or spotlight options
- RF-shielded LED control panel with adjustable dimmer control

Lighting and Comfort

MRI-compatible lighting can be integrated to provide a quiet, flicker-free environment inside the MRI room. RF-shielded control panels and filtered connections help prevent radio frequency interference from entering or radiating into the shielded room.

MRI RF Shielded Doors and Windows

RF Shielded Doors - Technical Performance

- RF attenuation aligned with IEEE 299 testing principles: > 100 dB (1 - 30 MHz magnetic field; 30 - 160 MHz electric field)
- RF shielding performance: 100 dB (10 - 100 MHz)
- Sound insulation: > 44 dB(A)
- Acoustic performance: STC-40 certified
- Standard dimensions: 1.22 m x 2.13 m; nominal clear opening: 1.20 m x 2.10 m

Door Structural Features

- Conductive and durable fabric for EMI/RFI sealing
- Reinforced aluminum frame and steel-supported door leaf
- MRI-compatible locks and accessories
- Stainless steel, antibacterial, laminate, or HPL surface options
- Low-profile threshold suitable for patient transfer
- Manual and pneumatic door options

RF Shielded Windows - Technical Specifications

- Standard size: 100 x 120 cm; custom sizes available
- Sound insulation: > 38 dB(A)
- Magnetic field attenuation: > 100 dB (1 - 30 MHz)
- Electric field attenuation: > 100 dB (30 - 160 MHz)
- Glass thickness: 6.4 mm laminated safety glass
- Acoustic performance: STC 40

Window Key Features

- Dual-layer conductive mesh structure for RF shielding
- Lightweight durable extruded aluminum frame
- Powder-coated surface finish
- Clear visual transparency for operator-patient observation
- Impact-, scratch-, and deformation-resistant surface
- Suitable for wall, ceiling skylight, or observation window applications

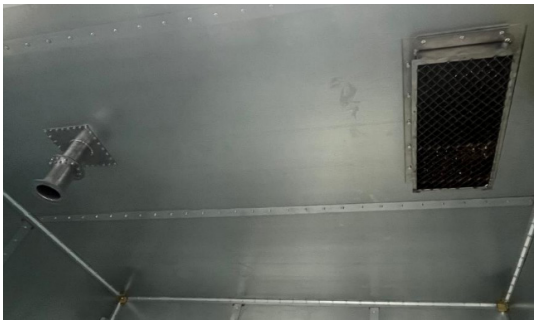
Internal Finishing, Magnetic Field Shielding, Waveguides and Quench Pipes

MRI Internal Finishing

- Interior wall cladding using HPL wall panels, wallboard, or plastic coverings
- Non-ferrous suspended ceiling system with commercial-grade ceiling tiles
- Medical-grade PVC flooring options
- Welded seams, skirting, and coved edges for hygienic continuity
- Interior decoration can be adapted to required materials and colors

MRI Magnetic Field Shielding

- Supports safety of personnel, MRI systems, and nearby medical equipment
- Helps reduce influence from nearby magnetic structures such as elevators or vehicles
- Supports stable operation of adjacent medical equipment
- Helps create safer conditions for individuals with electronic implants such as pacemakers
- Magnetic field mapping can be performed before physical shielding design



Waveguides, Penetrations and Quench Pipes

- RF-shielded waveguides and penetration components for medical gas, fiber optic feedthroughs, gas and water pipes, and air ducts
- Dielectric penetrations allow fiber optic cables or gas lines to pass without affecting room shielding performance
- Quench pipes are critical for superconducting MRI systems and safely vent helium gas to the atmosphere in emergency conditions
- The piping system must withstand sudden temperature changes from ambient to -269°C (4 Kelvin) within seconds
- Installation should follow the applicable international MRI site preparation and safety standards

MRI Lighting, Power Filters, RF Testing and Maintenance

Dimmable LED MRI Lighting System

- Integrated lighting solution for MRI rooms
- Control unit can include power supply, control boards, backup batteries, and RF filters
- Control equipment is positioned outside the Faraday cage
- All connections are RF filtered to prevent RF interference entering or radiating into the room
- Lightweight LED panels can be mounted into 600 x 600 mm ceiling grids
- High energy savings compared with halogen lighting

Virtual Skylite and Comfort Panels

- High-resolution decorative LED panels compatible with MRI environments
- Placed within the patient line of sight to create a calming atmosphere
- Helps reduce patient stress during scanning
- Suitable for MRI, radiology, CT, dental, and consultation rooms
- Can be installed as standalone decorative modules within existing lighting systems

MRI Power Filters

- Power line filters supply electrical power to the MRI room while preventing EMI from entering the shielded environment; typical capacities 5 A to 63 A
- Control line filters supply power to equipment while suppressing high-frequency noise; configurations from 2 to 12 lines
- Signal line filters are used for low-current telephone, data, and fire alarm circuits; available in 1 to 12-line models
- Filters are designed to maintain RF shielding integrity during installation

RF Testing and Maintenance

- Comprehensive RF shielding effectiveness testing after MRI room installation
- Verification against international RF protection requirements
- Periodic testing and maintenance recommended for long-term reliability
- Maintenance and service agreements can be arranged for MRI facilities according to project needs

About Shwehna Group

Shwehna Group supports healthcare and industrial projects with RF shielding solutions, functional materials, conductive coatings, and project-based technical coordination. For MRI environments, we focus on reliable shielding components, proper integration of site interfaces, and clear coordination with hospitals, contractors, and medical equipment providers.