



EMPP

ELECTROMAGNETIC
PULSE
PROTECTION



PROTECT YOUR ELECTRICAL ASSETS

MVG offers a complete range of shielded solutions for Electromagnetic Pulse Protection (EMPP), including shielded enclosures of all sizes from around 1m x 1m x 1m through to shielded racks, and much larger facilities of several (10's of) metres in any direction, including shielded ISO style containers. Coupled with this we also offer EMPP power line filters, along with being able to manage the other interfaces and penetrations which are needed. We can also work with you to organise the full acceptance and verification testing of the facility as required.

WHY CHOOSE MVG?



Proven Best Value

A solid track record of providing high-performance, cost-effective EMPP solutions.



Advanced In-House Electromagnetic Expertise

Seamlessly integrating design, testing, and global compliance for unmatched project delivery.



Global Reach, Local Support

A proven capability to deploy and maintain EMPP projects worldwide with trusted regional presence backed by solid finance foundation.



Advanced Products and Innovation

Delivering cutting-edge solutions with state-of-the-art technologies, leveraging on RF comprehensive expertise, for evolving industry needs.



+ What is EMP



AN ELECTROMAGNETIC PULSE, OFTEN ABBREVIATED AS EMP, IS A BRIEF BURST OF ELECTROMAGNETIC ENERGY.

EMP can occur naturally or be man-made and occur as an electromagnetic field, either as an electric field, a magnetic field, or as a conducted electric current. **Natural Sources of EMPs** come from phenomena such as solar flares and lightning strikes being the most prevalent sources. **Man-made electromagnetic pulses** are primarily associated with military applications, notably nuclear and non-nuclear EMP weapons. These can deliver a high energy EMP and disrupt communications equipment, airborne onboard computers, or even put the entire electrical network of a target country out of commission.

When energy is released in an EMP event it creates a sudden wave of electromagnetic energy, and in doing so it creates three main components that work together to affect different parts of electrical systems.

- (E1) A high-speed pulse that can instantly disrupt electronic circuits.
- (E2) An electrical surge from lightning, which most systems can handle with proper safeguards.
- (E3) A slower component that can induce currents in long conductors.

The **electromagnetic field** interference caused by an EMP can significantly disrupt communications and electronic equipment rendering them useless temporarily or permanently. It is therefore critical to understand the weaknesses of electronic systems to EMPs and develop protective measures ensuring their robustness.

One of the most effective methods of EMP protection is the use of shielded rooms or Faraday cages. These can protect sensitive equipment by redirecting the EMP energy around the exterior of the cage, preventing it from reaching the devices inside. In addition, surge protectors and specialized EMP filters can be installed in electrical systems to absorb and deflect the surges caused by an EMP. Many military and governmental facilities incorporate these protections in to their hardened infrastructures.

Preparing for EMP events involves multiple strategies to minimize potential disruptions but should prioritise the development of EMP-resilient infrastructure. Communication networks and data centers for example require robust backup systems to maintain connectivity. Such preventative measures and infrastructure can increase their resilience against the potential impacts of an EMP, ensuring quicker recovery and continuity of essential services.

EMP Protection is a branch of electromagnetic compatibility (EMC) engineering.

+ Integrated and Customizable EMPP solutions*

MVG's EMPP solutions provide EMP protection at two levels :

- 1 **Protection of equipment.**
- 2 **Guaranteeing continuous data operation via an uninterrupted and fully independent power source**

MVG designs, manufactures, and installs SmartShield™ products to meet the highest standards of security and HEMP/EMP protection, including NSA-94-106 and MIL-STD-188-125. In addition to system delivery, MVG offers comprehensive design and site-planning support, as well as installation and testing services to ensure the full protection of your facility. To maintain long-term performance, MVG provides maintenance and repair programs that extend the life and reliability of your shielding solutions.

+ Products

RF SHIELDED ENCLOSURES

- RF Shielded Doors
- Shielded Test Boxes
- Shielded Test Racks
- Shielded Containers

COMPONENTS

- EMP/HEMP Power Line Filters
- Waveguide Filters (FO applications)
- Shielded Waveguide Air Vents
- Waveguide Feed-throughs

TYPICAL EMPP CONTAINERS INCLUDE



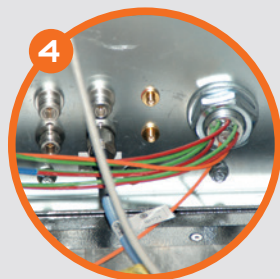
Customizable camouflage



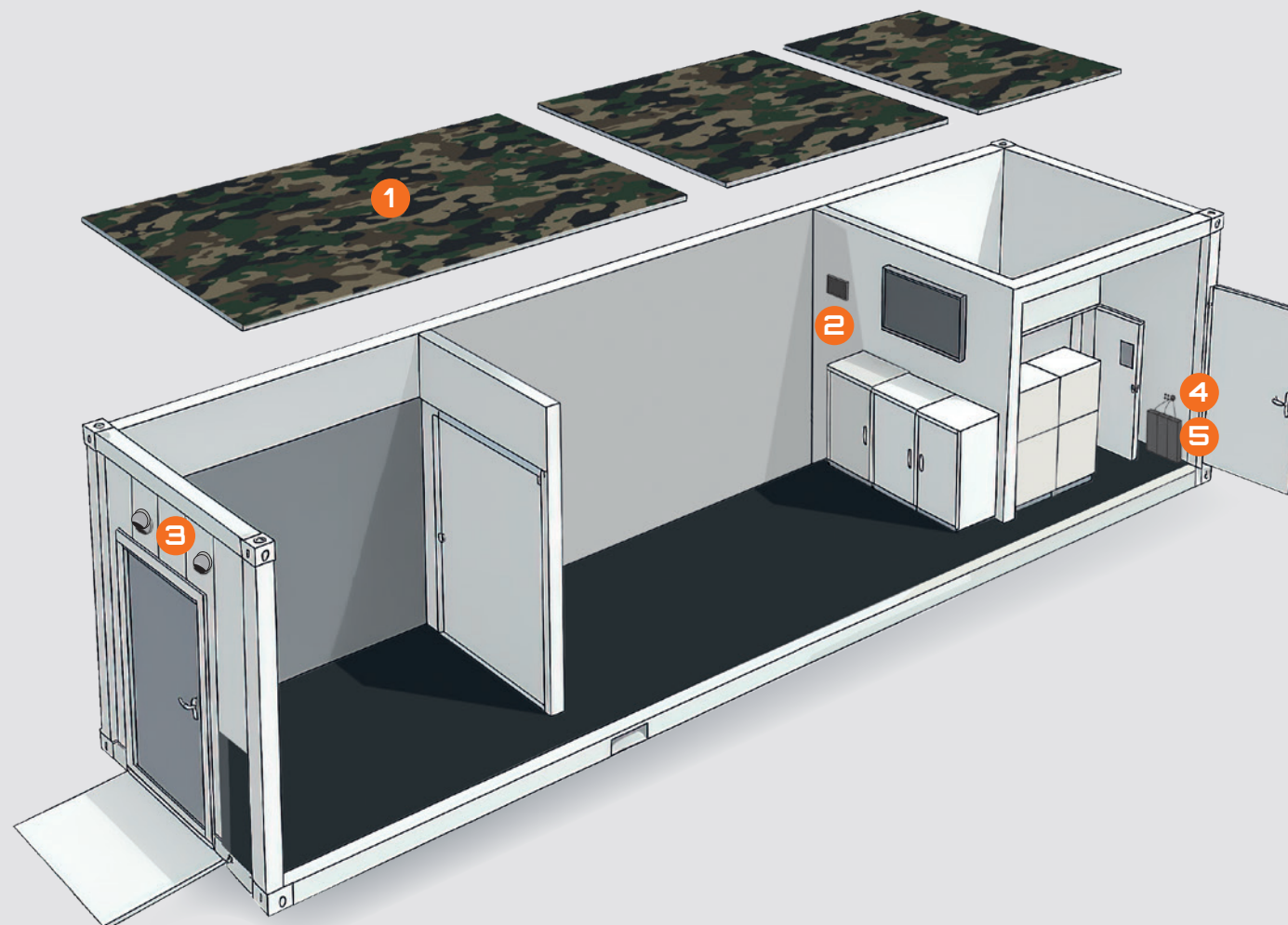
Waveguide Filters (FO applications)



Air vent



Waveguide Feed-throughs



EMPP SHIELDED CONTAINERS FEATURE

- Based on ISO 20', 40', and 45' containers; custom sizes available
- Designed for EMC and EMP testing or protection
- Fully customizable interior layout and equipment integration
- Office-style interior finish available
- Standard container external appearance for discreet deployment

5 EMP / HEMP POWER LINE FILTERS

Two or four individually filtered lines, with ratings of 277/480 VAC, 10 A to 1200 A, Filters (also DC power line filters) are also compliant with MIL-STD-188-125-1



Power Filters

+ RF Shielded Enclosures

RF Shielded Rooms



SmartShield™ high performance, modular construction shielding system

Dimensions and shape to suit customer requirements

- Lengths/ Widths: 1.5 m to 20 m or more.
- Heights: 2.2 m to 10 m or more.

Standard Equipment

- Shielded doors from 0.9 m wide personnel doors to 5 m wide (or more) equipment doors. Includes optional manual or automatic ramps as required
- RF Power Line filters from 6 A to > 400 A, Single Phase, Three Phase and DC

Other elements:

- Feedthrough connectors and interfaces as required, including BNC, N-Type, SMA, fibre optic, ethernet, USB, etc
- Attenuvents
 - Electrical distribution system including consumer unit, sockets and lighting
 - CCTV systems
 - Air conditioning systems
 - Fire detection and suppression systems
 - Internal linings, plasterboard or acoustic panels
 - Shield attenuation testing

Typical Shield Attenuation per EN 50147-1

Magnetic Field

- 10 kHz ≥ 80 dB
- 100 kHz ≥ 100 dB
- 1 MHz ≥ 100 dB

Electric Field

- 100 MHz ≥ 110 dB

Plane Wave

- 2 GHz ≥ 110 dB
- 10 GHz ≥ 100 dB
- 18 GHz ≥ 100 dB
- 40 GHz* ≥ 100 dB

* If 40 GHz option is selected

RF Shielded Doors



MVG SmartShield™ doors are manufactured to the same high quality as our shielded rooms and complement with excellence any high performance shielding system.

- The doors are available in manual, semi- and full automatic operation, for both swing door designs and sliding.
- The high performance shielding results are achieved using a knife edge closure system, utilizing beryllium copper finger contact strips.
- Highly engineered hinge systems ensure accuracy of closure, long life and easy maintenance. A pivoting hinge is used for the swing doors in order to ensure the durability of the fingerstock gaskets mounted in the door frames.
- The sliding doors are designed to provide the same extended shielding effectiveness and performance as the swing door products.
- For servicing purposes the door mechanics are contained outside the shielding panels of the door. Since this is not an essential part of the shielding, it facilitates all maintenance work without affecting the shielding performance of the facility.
- All automatic doors have a fail-safe system such that if a power failure occurs the chamber remains accessible. Security systems for authorized access are available from simple locking systems to fully integrated keypad or card type arrangements.

Shielded Test Cells



- 10 kHz - 20 GHz (40 GHz)
- With an operating frequency starting at 10kHz, the Shielded Test Cells (STC) create an ideal environment for testing wireless devices for such technologies as GSM, UMTS, CDMA, Bluetooth, DECT, etc. Developed for the R&D, production and quality control environments where space is critical.

Shielded Test Cabinets



- Typically, used to house racks of equipment providing EMC or EMP protection.
- Typically no anechoic linings.

Shielded Containers



- Our largest shielded test cells are shielded containers based on standard ISO 20', 40' and 45' containers and are commonly used for either, EMC or EMP applications.

Testing Connectivity for a Wireless World

The Microwave Vision Group offers cutting-edge technologies for the visualization of electromagnetic waves. With advanced test solutions for antenna characterization, radar signature evaluation and electromagnetic measurements, we support company R&D teams in their drive to innovate and boost product development.



For more information:
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