Panzer

SHIELDING TECHNICS

EMC
SHIELDING SYSTEMS

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The ever-increasing use of electronics in all areas of industry, trade and services, coupled with miniaturization and higher packing densities, increasingly leads to disturbances in the individual system components among each other. An important quality feature for assessing interference is the electromagnetic interference Compatibility (**EMC**).
It characterizes that an electrical unit is able to function within its surrounding without interfering or being interfered with by electromagnetic fields of other appliances. Metallic shielding offers effective protection against electromagnectic interference emissions, and is used as room or building shielding.
Due to our assembly method it is possible to adjust the interior layout within the shield to the exact requirements of the user without reducing the EMC-protection.

EMC – CHAMBERS

The HF screening cabinets required for normal measurement tasks are a closed cover made of galvanized steel sheet. The approved module construction consists of 2 mm thick folded panels with welded corners for RF integrity. The folded panel guarantees stability and provides a wide flange for assembly and compression of the RF gasket. The panels can be manufactured from other materials, typically high-grade steel, copper or aluminium.
The graduations for the sheet metal dimensions are 10 cm. Therefore any chamber dimension is possible in steps of 10 cm.

However as an option it is possible to have an exactly dimensioned chamber to meet the existing host building size. The double row RF-gasket will guarantee, in any case, excellent shielding attenuation values:

80 dB / 10 kHz	**magnetic field H**
100 dB / 100 kHz	**magnetic field H**
100 dB / 10 kHz - 1 GHz	**electric field E**
100 dB / 1 GHz - 20 GHz	**plane wave**

DOORS

Also important for the sealing of the shielded chamber is the use of a knife-edge door. A double row of BeCu-finger contacts is placed in an U-channel in the door panel. This facilitates service or repair work with the contacts as the door can be removed and put on a bench. The finger contacts can be exchanged by removing the clamping profile.

CONSTRUCTION

The doors are mainly single leaf-doors (200 x 100 cm clear opening). It is also possible to build in double doors or sliding doors (mainly with anechoic chambers). The activation of large doors can be manual or fully automatic with pneumatic or hydraulic closing functions. Automatically operated ramps will help for a safe and stepfree access to the shielded room. Regular cleaning and maintenance of the RF-sealing of the door is necessary, we recommend a maintenance and service contract.

The chambers will be supplied with structurally calculated wall supports and roof beams so that the chamber can be installed as a free-standing structure. Of course it is also possible to integrate the chamber into the existing walls and ceilings. We will work out the most cost-effective solution for you!

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INTERIOR

The chamber will be equipped with an internal raised double floor (carrying capacity 500 kg/m2) level inside with the door threshold. Any floor finish requested by the customer can be installed (PVC, vinyl, metal, wood etc.). Further interior installation can be adjusted according to customer use. To prevent damaging the shielding all required mounting parts can be fixed to the inner boardings of the shielding panels. By building-in simple wall linings normal room conditions will be achieved, moreover all safety standards of personnel protection can be fulfilled (additional noise- and heat-protection). This also applies to shielded ventilation vents allowing sufficient air circulation.

FILTERING

A shielded room also requires filtering of all electrical supply lines. For this there are available current compensated and also low-leakage power line filters . The insertion loss performance of the filters is higher than the shielding attenuation of the chamber. Therefore it is guaranteed that with the filters will not degrade the shielding efficiency of the room.

This may be critical with the data line filters. The high transmission rates of these filters require a filter pass band which will degrade the room shielding. In this case we recommend fiber optic connection with a converter on both sides, one outside and one inside the chamber. We can offer a complete transmission system.

ELECTRICAL INSTALLATION

The electric installation in the shielded chamber consists of a secondary distribution board with ELCB and MCB´s. All supply lines are laid in conduit on the walls which also carry all necessary sockets and switches. As an alternative all additional power supply lines can be installed under the double floor, with floor mounted sockets (preferred with anechoic chambers).

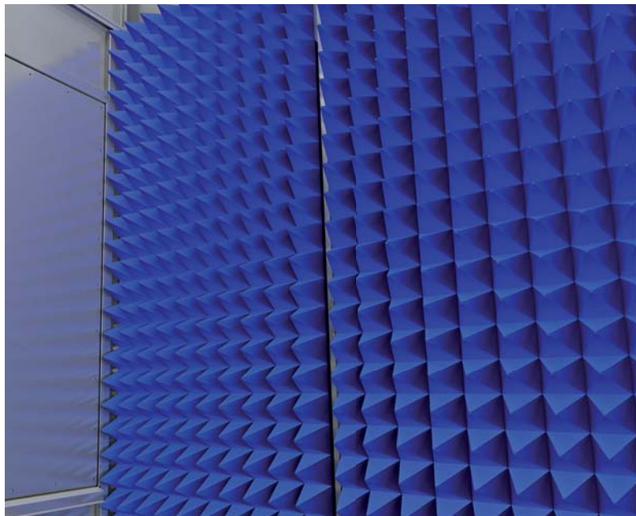
For lighting halogen spot lights usually are used as these lamps are interference free. Additional flourescent fittings can be installed for better illumination of the chamber and they can be switched off during tests.

ANECHOIC CHAMBERS

For certain EMC-measuring procedures anechoic rooms are advantageous or absolutely necessary (interference emission and interference immunity). Installing absorbers helps to absorb reflection from the metallic surfaces of the chamber. We offer the following materials: Classical foam pyramids impregnated with carbon. The attenuation of these absorbers increases with increasing frequency, as the height increases, the usability shifts to lower frequencies. Satisfactory results are obtained when the minimum height of the pyramids is 25-30% of the lowest measured wavelength. This requirement results in hall dimensions which can not be realized in many cases. An alternative is provided by ferrite absorbers, which are used as thin tiles (5-6 mm). They offer nearly constant attenuation characteristics in the range of 30 – 1000 MHz.

A typical absorber chamber with ferrite tiles for 3-m-measurment distance has dimensions of about 7 x 3 x 3 m and with regard to price and capabilities it is a real alternative to a hall with pyramidal absorbers. A combination of ferrite- and pyramidal absorbers enables the use of low absorbers with low frequencies. On the other hand, such a „hybrid absorber" does not reach the high attenuation values of a pure pyramid absorber of approximately 50 dB.

Shielding Chambers manufactured by PANZER can be installed with any kind of absorber. The inner linings of the steel panels are suitable either for direct fixing of ferrite tiles as well as by a rail system allowing the pyramids to be fastened with glue or hung.



DATA TECHNIQUE

In addition to the EMC measuring technology, the monitoring protection in the EDV is an important application for room and building shielding. The use of electronic data processing devices by banks, and insurance companies, as well as civil and military offices, requires, besides data safety and fire protection, more and more protection against interception. There are areas where appropriate measures for data protection are legally required.

Our shielding projects can be planned and carried through as room-within a-room shielding or as free-standing room with interior and external lining. This includes the complete equipment for the computer centre (current supply, air conditioning technique, fire protection etc.)

MILITARY

Besides the stringest requirements for military facilities as regarding interception safety and controlling of secret data specified by TEMPEST, NSA65-2, MIL-STD 285, SHIELDING TECHNIQUE can help solve special problems. E.g. the examination of sensitive electronic data processing areas as to their confidential emission,

bug devices as well as comprehensive protection against nuclear radiation (NEMP), lightning strikes (EMP), mechanical damage and noise. Panzer offers comprehensive solutions for infrastructual measures of NEMP-protected installations.

SERVICE

As a service Panzer will offer maintenance for shielding of all kinds. This mainly refers to movable parts and those not wear-resistant, as e.g. doors. We also offer maintenance and performance check of the shielding itself and of the electrical filters. Furthermore we will carry out installation and dismantling of shielded rooms as well as extention, rebuilding or removal of

shielded rooms. Missing parts can be replaced. We also offer second-hand rooms manufactured by well-known producers. Upon request shielded rooms which are no longer needed can be bought or disposed of by us. Second-hand shielded rooms to be sold by us will be guaranteed for up to 5 years depending on their condition.

SHIELDING ROOM AS A SILENT ROOM

The Silent Room transforms a technical shielding enclosure into a modern, comfortable workspace. A high-quality interior finishing system conceals the technical shielding structure, creating an aesthetically pleasing office environment with excellent acoustic comfort while maintaining the full electromagnetic shielding performance.

INTERIOR FEATURES

- Modern office-style interior design
- Concealed shielding construction
- Smooth wall and ceiling finishes
- High-quality acoustic wall panels
- Decorative wall cladding in various finishes
- Integrated LED lighting
- Raised floor with carpet, vinyl, wood, or other floor coverings
- Flush cable management
- HVAC integration with low-noise ventilation
- Acoustic ceiling system
- Glass elements and interior windows (optional)
- Corporate color and branding options

DESIGN BENEFITS

- Comfortable working environment
- Improved room acoustics
- Pleasant lighting conditions
- High-quality office aesthetics
- Suitable for executive offices, conference rooms, secure meeting rooms, and control centers
- Fully customizable according to customer architectural requirements

TYPICAL APPLICATIONS

- Secure Meeting Rooms
- TEMPEST Offices
- Government Facilities
- Intelligence and Defense Buildings
- Data Center Control Rooms
- Research & Development Facilities
- Financial Institutions
- Healthcare Facilities
- Critical Infrastructure (CNI)

OPTIONAL INTERIOR PACKAGES

FEATURE	SPECIFICATION
Ceiling	Suspended acoustic ceiling
Flooring	Carpet, vinyl, parquet, raised access floor
Lighting	Dimmable LED office lighting
Furniture	Customer-specific office furniture integration
Acoustics	Sound-absorbing wall and ceiling systems
HVAC	Low-noise climate control system
Glass	Acoustic or EMI-shielded glazing

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In der Hirtenwiese 6,
35745 Herborn
Germany
www.mueller-safe.de