GROUP MASCOM

TESTING LABORATORIES FOR ELECTRONIC MEASUREMENTS

MASCOM GROUP PRODUCTS


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ABOUT THE MASCOM GROUP OF COMPANIES

The MASCOM group of companies is a leading Russian manufacturer of laboratories for special electromagnetic and acoustic measurements. As one of the market leaders, MASCOM Group has been leading the industry forward for more than 25 years, developing and introducing the newest technologies in the field of

- EMC testing and measuring laboratories (anechoic screened chambers);
- measuring instruments, including for military use;
- specialised software (SSW) of controlling measurements.

Our high-tech solutions are guaranteed by:

- our own design and production facilities that allow solving various, including non-standard, tasks;
- many years of experience in operating measuring systems in MASCOM Group laboratories, which, in turn, provides for excellent ergonomics and a user-friendly specialised software interface

Our customers:

- Ministry of Defence of the Russian Federation
- Federal Security Service of the Russian Federation
- Federal Penitentiary Service
- OJSC Corporation for Tactical Missile Armaments
- JSC United Rocket and Space Corporation
- JSC Air and Space Defense Concern Almaz-Antey
- United Instrument-Making Corporation JSC
- JSC Concern Morinformsystem-Agat and other enterprises of the military-industrial complex

ANECHOIC CHAMBERS

Anechoic chambers (AEC) are used in various industries to carry out scientific research and to monitor compliance with the requirements of various industry standards.

MASCOM Group performs an entire range of tasks for the creation of AEC in accordance with military and civil standards for EMC: from the formulation of technical requirements and the development of working design documentation up to and including the commissioning the facility with its subsequent certification and warranty technical and service maintenance.

It is possible to fully equip the laboratories with modern measuring instruments (including those of our own design), as well as with software and hardware to automate the measurement process.

In accordance with State Standard GOST R 50414-92, the chambers provide a screening efficiency corresponding to 1 class in the frequency range from 0.01 MHz to 18 GHz:

- magnetic field: from 60 to 100 dB in the frequency range from 10 kHz to 1 MHz;
- magnetic field: not less than 100 dB in the frequency range from 1 to 30 MHz;
- electric field: not less than 100 dB in the frequency range from 30 to 500 MHz;
- plane wave: not less than 100 dB in the frequency range from 100 MHz to 18 GHz.

IMPLEMENTATION OPTIONS

- Modular all-welded type
- Collapsible type

FEATURES

- Engineering preparation of premises
- Provision of temperature and humidity regimes for any conditions
- “Clean” anechoic chambers

The overall dimensions of the shielded chamber depend on the customer’s requirements or on the intended use.

ANECHOIC SCREENED CHAMBER MK-BEK-3

A chamber with a 3-meter measuring distance. It is a fully compliant anechoic chamber with a measuring distance of 3 m and a frequency range from 30 MHz to 40 GHz. The size of the quiet zone is 1.5 x 1.5 m

BASIC CONFIGURATION:

- Screened housing 9.15 x 7.10 x 6 m (external dimensions, including the carrier frame).
- Screened door (dimensions 900x2000 mm (WxH)
- Radio-absorbent material:
  - for the range of 30 MHz - 1000 MHz, the walls, the floor and the ceiling are covered with ferrite tiles 100x100x6 mm, with absorption characteristics from -15 to -25 dB;
  - for the range 1000 MHz - 18 (40) GHz, the walls and ceiling are covered with pyramidal absorbers ERIDAN-MP530; on the floor there are removable units with pyramidal absorbers ERIDAN-MP530, with absorption characteristics from -30 to -45 dB.
- Filtration system for the power supply network (2 filters 40A, 16A)
- Filtration system for supply and exhaust ventilation
- Low-pass filtration system
- System H/F connectors:
  - Access panel with H/F connectors: 3 pcs. N-type, 3 pcs. SMA.
- Power supply system
- Ventilation system:
  - 4 ventilation vents equipped with radio-absorbent materials inside the AEC.
- Low-current systems:
  - 2 analogue fire alarm sensors .
- Fibre-optic input system:
  - Optical input for 6 optical fibres with a diameter of up to 3 mm, for inputting fibre optic communication cables and controls.

OPTIONS:

- Rotary table
- Automatic antenna mast
- GPIB interface controllers
- Additional power filters, data filters and special connectors
- Supply and exhaust ventilation system;
- Air conditioning system;
- CCTV system;
- Intercom system / audio system
- Fire alarm signalling system

TESTS:

- Screening efficiency
- Field heterogeneity factor
- SWR measurement
- Attenuation ratio

Compliance with standards:

- GOST R 50414-92

WARRANTY TERMS:

- for screened enclosure , screened door and filtration systems - 36 months
- for electronic components and equipment - in accordance with the warranty periods specified in the equipment certificates.

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ANECHOIC SCREENED CHAMBER MK-BEK-10

A chamber with a 10-metre measuring distance. It is a fully compliant anechoic chamber with a measuring distance of 3 m and 10 m and a frequency range from 30 MHz to 40 GHz. The size of the quiet zone is 5 x 5 m.

BASIC CONFIGURATION:

- Screened housing 21.7 x 13.8 x 8.6 m (external dimensions, including the carrier frame)
- Screened door
- Radio absorbing material
- Power supply network filtration system
- Filtration system for intake and exhaust ventilation
- Low-current filtration system
- The system of H/F connectors. Power supply system. Ventilation system. Low-current system. A system of fibre-optic inputs.

OPTIONS:

- Turntable (any diameter, any load)
- Automatic antenna mast (scan in height from 1 to 4 m); polarization change
- GPIB Interface controllers (For remote control of positioners)
- Additional power filters, data filters and special connectors
- Ventilation intake and exhaust system
- Air-conditioning system
- CCTV system
- Intercom system / audio system
- Fire alarm system

WARRANTY TERMS:

- for screened housing, screened door and filtration systems - 36 months
- for electronic components and equipment - in accordance with the warranty periods specified in the equipment certificates.

TESTS:

- Screening efficiency
- Field heterogeneity factor
- SWR measurement
- Attenuation coefficient

Compliance with standards:

- GOST R 50414-92

SCREENED GATES AND DOORS

MASCOM Group develops and delivers screened doors and gates of its own production in all sizes and classes in accordance with customer requirements.

DOOR TYPES

- hinged doors (single-leaf / double leaf)
- sliding doors / doors

Features

For reliable electrical connections, copper-beryllium contact springs are used which are pressed against opposite contact surfaces when the door is closed. High-flexibility springs are mounted along the entire perimeter of the door frame, equipped with a holding clip that snaps into the groove in the substrate material to simplify the replacement of springs without special tools. The door is completed with three rows of contact springs along the perimeter. All open surfaces are protected from corrosion by galvanizing.

Reliability of construction. Manual and pneumatic configuration. Easy-to-open lever handle.

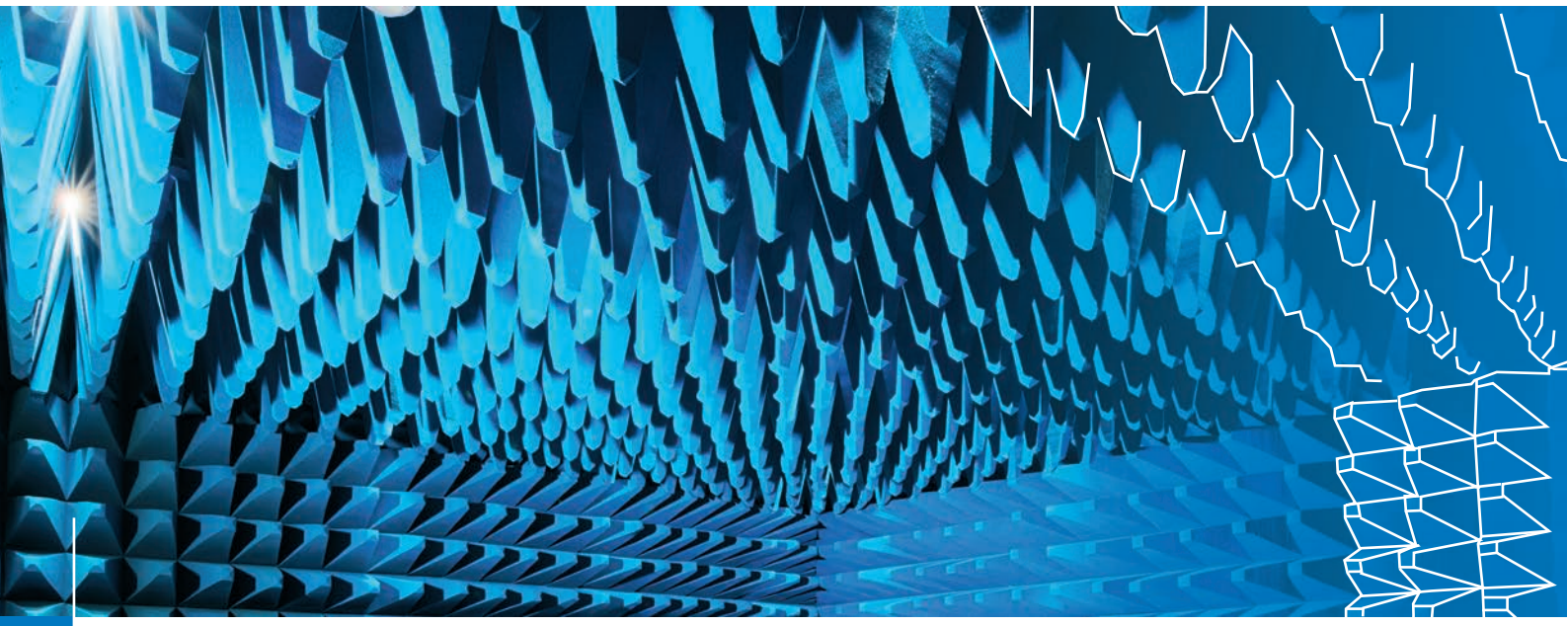
CHARACTERISTICS

Screening efficiency in accordance with State standards up to 100 dB in the frequency range 0.01 MHz to 18 GHz

OPTIONS

You can additionally install auto-locking mechanisms, latches and emergency opening mechanisms. In addition, the door can be equipped with an additional ramp for the transport of heavy equipment (optional) and a pneumatic unlocking / locking system.

RADIO-ABSORBENT MATERIALS (RAM)



MASCOM Group supplies and installs radio-absorbent materials (RAM) of the volumetric resistive type of own production. RAM series «Eridan» is a tetrahedral pyramid made of polymer materials with ultra-dispersed carbon filler.

RPM SERIES «ERIDAN»

External dimensions
525x175x530 (LxWxH)

Frequency range
40 MHz - 40 GHz

Fixing
assembly design, blocks with size 525x525 mm (L x W)

CONDITIONS OF OPERATION

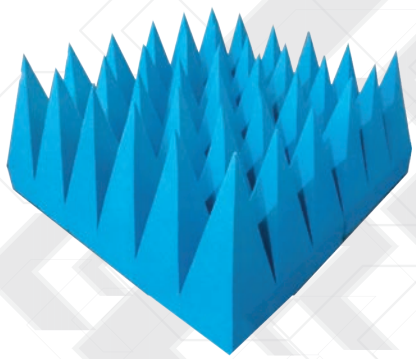
Ambient temperature
from +5 to + 60°C

Relative humidity
not more than 80%

Combustibility
self-extinguishing material

Power reflection coefficient for a falling electromagnetic wave along the normal to the product

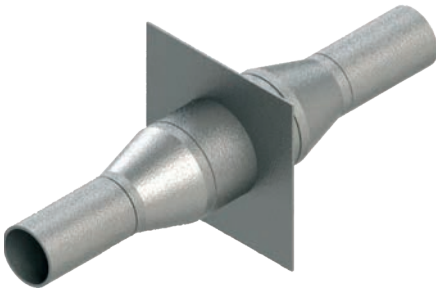
100 MHz	-15 dB
150 MHz	-20 dB
300 MHz	-30 dB
600 MHz	-35 dB
1,5 GHz	-40 dB
3 GHz - 40 GHz	-50 dB



FILTERS
AND LINE COMPONENTS

QUARTET-S SERIES OPTICAL FILTERS

Frequency range
10 kHz- 40 GHz
Attenuation in the magnetic component
not less than 80 dB
Attenuation in the electric component
not less than 80 dB

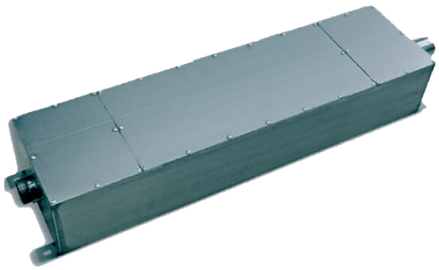


QUARTET-N SERIES PIPELINE FILTERS

Frequency range
10 kHz- 40 GHz
Attenuation in the magnetic component
not less than 80 dB
Attenuation in electrical component
not less than 80 dB

QUARTET-O SERIES AIR FILTERS

Frequency range:
10 kHz- 40 GHz
Attenuation in the magnetic component
at least 80 dB
Attenuation in electrical component of
at least 80 dB



QUARTET-E SERIES INTERFERENCE FILTERS

Frequency range
150 kHz- 40 GHz
Attenuation in the magnetic component
at least 60 dB
Attenuation in electrical component of
at least 60 dB

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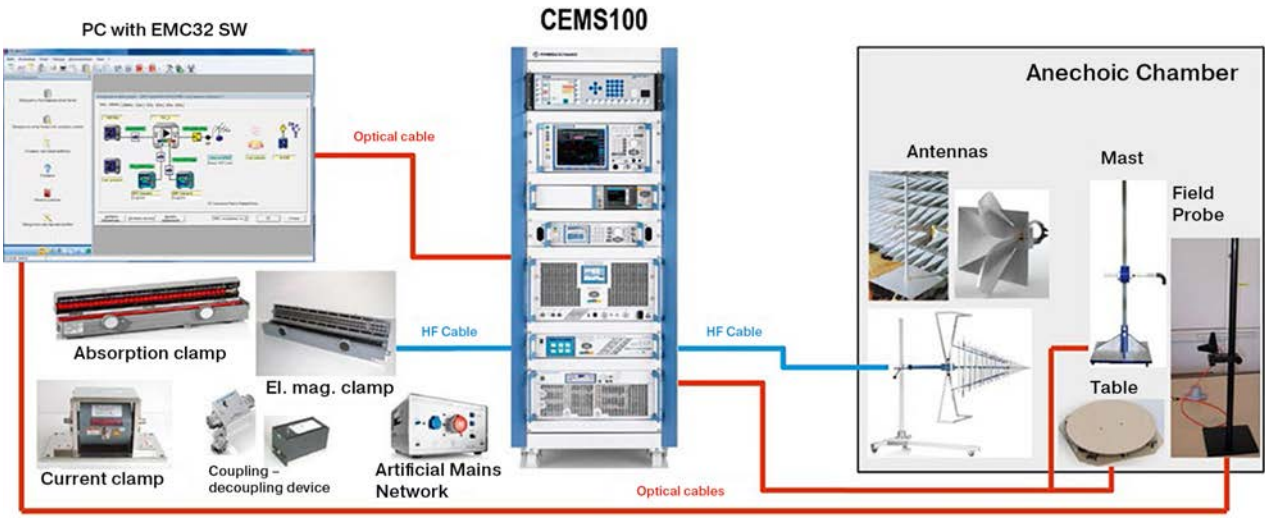
MODULAR EMC TESTING SYSTEMS

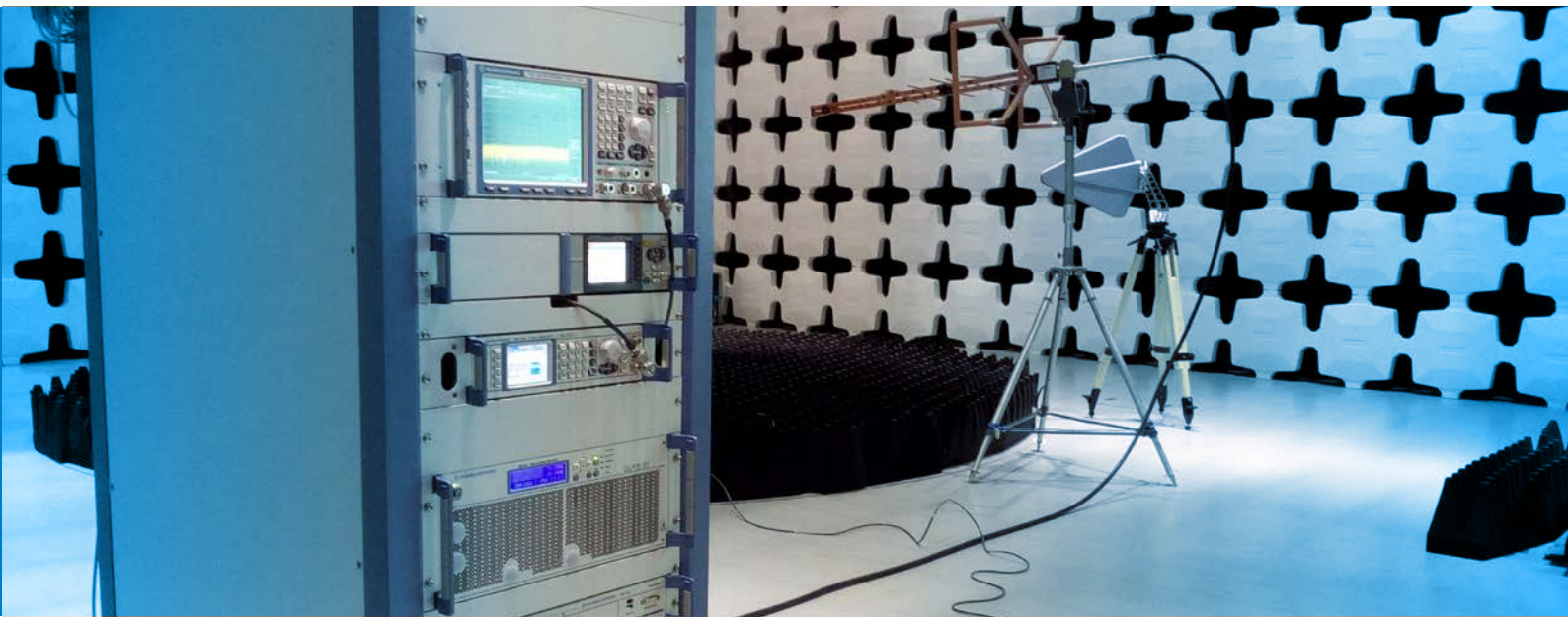


The design of the electromagnetic compatibility (EMC) testing system equipment is based on the customer's goals and objectives, the types and manner of testing, the requirements of the standards for which compliance is tested, as well as any special technical requirements.

MASCOM Group designs and supplies systems both for testing interference immunity and for measuring interference emissions.

The EMC test system is built in a modular manner, providing a flexible approach for upgrading equipment, expanding its functionality, and organising engineering personnel workplaces.

TESTING INTERFERENCE IMMUNITY



A significant expansion in the range of electrical, electronic and radio-electronic products and components has greatly increased the risk of functional disturbance and equipment/system damage due to exposure to interference. The products and components currently in use are generally quite susceptible to conductive and radiated interference, to electrostatic discharges, and especially to high-frequency and impulse noise. Currently, there are product and system standards and requirements for immunity to electromagnetic interference, as well as corresponding tests of the electromagnetic environment in which these product/systems operate.

MASCOM group creates integrated solutions for equipping testing facilities and laboratories for the purpose of conducting immunity tests using both Russian-made equipment and equipment from leading world manufacturers.

According to customer requirements, the testing equipment can provide conclusions based on the results of special testing and prepare documentation with operating instructions based on the results of special studies, providing conditions of dislocation and operation when installed in premises destined for conducting «closed negotiations»

MEASUREMENT OF INTERFERENCE EMISSIONS

Modern electrical, electronic and radio-electronic devices and components, when in use, generate collateral electromagnetic processes that propagate in space and in the conductors to which they are connected, i.e. they are sources of radiated and conductive interference emissions.

MASCOM Group has developed integrated solutions for equipping testing centres and laboratories, in accordance with State standards and using equipment from leading world manufacturers, to perform measurements of interference emission, as presented in the table below.

Measurement of interference emissions	
Emission of harmonic current components by equipment with a current consumption not exceeding 16 A (in one phase).	GOST 30804.3.2-2013 (IEC 61000-3-2: 2005)
Restriction of voltage variations, voltage fluctuations and flicker in low-voltage general-purpose power supply systems. Equipment with a current consumption of not more than 16 A (in one phase), connected to the electrical network when the specified connection conditions are not observed.	GOST 30804.3.3-2013 (IEC 61000-3-3: 2005)
Conductive and radiated interference emissions	GOST CISPR 15-2014, GOST R 51318.11-2006 (CISPR 11: 2004), GOST 30805.14.1-2013 (CISPR 14-1: 2005), GOST 30805.22-2013 (CISPR 22: 2006)

EDUCATION

The MASCOM group of companies has its own educational centre – the Non-commercial Educational Institution for Further Professional Education “MASCOM” Education Centre for Information Security (Department of Education Licence No. 038316 dated 03.04.17), which conducts supplementary professional programmes (advanced training and professional retraining).The conducting of supplemental professional programmes is directed at satisfying educational and professional requirements, as well as the professional development of personnel engaged in high-tech industries, including in the field of electro-magnetic compatibility (EMC).

A list of educational sections, disciplines and topics
Topic 1. The main problems resulting from not complying with requirements for electromagnetic compatibility, and their consequences
Topic 2. Methods for eliminating problems caused by non-compliance with EMC requirements. Measures to protect against interference emissions.
Topic 3. Basic concepts, definitions and professional terminology in the field of EMC testing.
Topic 4. The main requirements of regulatory documents and standards in the field of EMC testing for measuring interference emissions - CISPR, GOST R; GOST RV
Topic 5. Standards for radio interference sources. Voltage standards for interference at mains terminals. Standards for radiated emissions. Standards for radiated disturbance to protect against interference from security radio services
Topic 6. General requirements for performing measurements. Levels of extraneous radio interference
Topic 7. Requirements for measuring equipment for measuring disturbances
Topic 8. Main measuring equipment for measuring interference emissions
Topic 9. Location requirements for objects being researched. Connecting cables. Connection to the power supply network on the measuring platform. Requirements for the load equivalents of devices being tested.
Topic 10. Measurement site requirements for measuring field intensity. Requirements for an alternative measurement site for performing field strength measurements.
Topic 11. Requirements for anechoic chambers. Main parameters.
Topic 12. Attestation requirements for the measuring platform.
Topic 13. Measuring conductive disturbances. Voltage measurement for mains terminals.
Topic 14. Measuring interference power. Measuring disturbance current strength
Topic 15. Measuring radiated disturbance in the frequency range from 9 kHz to 1 GHz. Location of research objects. Preparation for testing. Methods and methodologies for interference measurements.
Topic 16. Measurement of radiated interference in the frequency band from 1 GHz to 18 GHz. Location of research objects. Preparation for testing. Method and methodology of interference measurements.
Topic 17. Processing and evaluating test results. Protocol on interference measurement results. The main requirements for preparing the document.
Topic 18. Precautions for conducting noise emission measurements
Final certification

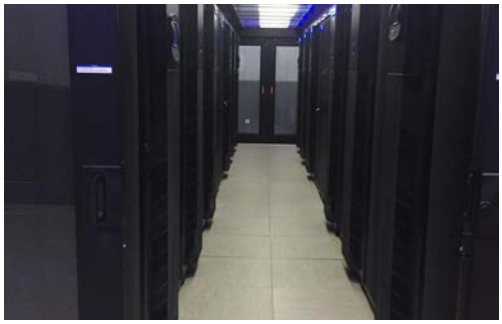
SUCESSFULLY COMPLETED PROJECTS











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