

Vojenský technický ústav, s. p.

EMC TEST SITE



The EMC test site was founded in 1993, thus, it is a testing laboratory operating for the longest time on the CZ territory having available the high-tech equipment and experienced employees. Within the CZ, this testing laboratory is a leading working place fully comparable with the highly developed foreign laboratories. It provides both accredited and non-accredited testing in the EMC area (interference - EMI and susceptibility - EMS) for the needs of the Czech Army and civil sector too.

The test site is able to verify the conformity with the requirements of the following legislative documents:

- Directive No. 2004/108/EC of the European Parliament and Council (EMC),
- Directive No. 2004/104/EC of the Commission (hf disturbance from the motor vehicles),
- Government order No. 616/2006 Col. (technical requirements on the products concerning the EMC),
- Government order No. 426/2000 Col. (radio and telecommunication devices),
- Government order No. 1/2008 Col. (health protection against the non-ionising radiation),
- Law No. 412/2005 Col. concerning the confidential information and concerning the security within the scope of:
 - attenuation measuring of the Faraday and shielded chambers,
 - compromising electromagnetic emissions measuring.

The tests are made according to the harmonised Czech and European EMC standards, for the military sector according to the valid Czech military standards (ČOS), NATO standards (AECTP, STANAG) and according to the MIL-STD. Tests for civil sector are an important base for the "EC Declaration of Conformity" issuing and for the marking of the product by CE mark.

VTÚPV owns following documents related with EMC testing:

- Authorisation decree No. 30/2007 issued by the Czech Office for Standards, Metrology and Testing, which authorises the company as the Authorised Body No. 266 to the activities within the scope of the Directive No. 2004/108/EC (EMC); at the same time it works as Notified Body No. 1380,
- Accreditation certificate No. 635/2007 issued by the Czech Accreditation Institute for the testing laboratory No. 1103, which part the EMC test site is,
- Authorisation issued by the National Security Office for attenuation measuring of the Faraday chambers.

The test site employees are members of the following Czech standard committees:

- TNK 47 (EMC),
- TNK 96 (EMC and radio spectrum),
- TNK 124 (EPS and alarm systems).

The testing site owns also the mobile equipment enabling the making of some tests directly at the manufacturer or on the installation site (e.g. for bulky products or technological entities).

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EMC TEST SITE

ELECTROMAGNETIC INTERFERENCE LABORATORY (EMI)

This laboratory carries out the electric and electronic devices tests for the electromagnetic energy radiation assessment.

The accredited tests include measurements the measurements in the following areas:

- Electromagnetic radiation through the device cover (electromagnetic field) measuring:
- Electromagnetic field intensity H component H (20 Hz 30 MHZ),
- Electromagnetic field intensity E component (100 Hz 40 GHz),
- High-frequency output power (1 40 GHz),
- Compromising radiation measuring from computers and from other devices processing, storing
- Conducted emissions (disturbing voltages, currents and power conducted by lines) measuring:
- Disturbing terminal voltages (9 kHz 108 MHz),
- Discrete disturbance (quick failures),
- Disturbing currents (9 kHz 100 MHZ),
- Disturbing power (30 MHz 1000 MHZ).

Radio transmission parameters measuring:

- EN (ETS / ETSI) 300 220, 300 330, 300 440, 300 113 etc,
- Gain measurements and antenna radiation pattern.

Shielding attenuation and efficiency measuring of:

- Faraday chambers, containers and boxes,
- Filters and noise-suppressing elements,
- Shielding materials,
- Cables, connectors,
- Antenna and cable networks elements.



IVECO vehicle testing according to the MIL-STD-461E



Coach testing according to the railway standards

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EMC TEST SITE

ELECTROMAGNETIC SUSCEPTIBILITY LABORATORY (EMS)

Makes the accredited tests concerning the effects of:

- Electrostatic discharge,
- RF electromagnetic field,
- Fast transients,
- Surge,
- Conducted interference,
- Magnetic field of the network frequency,
- Magnetic field pulses,
- Magnetic field damped oscillations,
- Oscillating waves,
- Supply voltage drops and failures,
- Slow voltage variations (both 1 and 3 phase),
- Frequency changes,
- Nuclear electromagnetic pulse (NEMP),
- High power microwaves (HPM),
- Ultra-wide-band signals (UWB).

In the LF EMC area, the laboratory measures:

- Distribution networks interference harmonics,
- Distribution networks interference voltage
- fluctuation ("flicker").



Workplace for supply voltage drops and failures, frequency changes, slow voltage variations, harmonics and voltage variation testing



Workingplace for measuring of electromagnetic resisivity against the HF field

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EMC TEST SITE TECHNICAL TESTS LABORATORY

The laboratory carries out the accredited tests according to the:

- ISO standards: Electromagnetic compatibility Road vehicles Propagation of electrical transient phenomenon through the power line and electrical transmission of transient phenomena through capacitive and inductive bond that are transmitted by lines other than power lines.
- EN 60068-2-1: Environmental testing Part 2-1: Tests Test A: Cold.
- EN 60068-2-2: Environmental testing Part 2-2: Tests Test B: Dry heat.
- EN 60068-2-14: Environmental testing Part 2-14: Tests Test N: Change of temperature.
- EN 60068-2-30: Environmental testing Part 2-30: Tests Test Db: Damp heat, cyclic (12 h + 12 h cycle).
- EN 60068-2-52: Environmental testing Part 2: Tests Test Kb: Salt mist, cyclic (sodium chloride solution).
- EN 60068-2-78: Environmental testing Part 2-78: Tests Test Cab: Damp heat, steady state.
- EN ISO 9227: Corrosion tests in artificial atmospheres Salt spray tests.
- Environmental tests according to ČOS 999905, MIL-STD-810, AECTP-100, 200, 230 and STANAG 4370 military standards.
- RTCA/DO-160: Environmental Conditions and Test Procedures for Airborne Equipment.
- Regulation No. 48 of the Economic Commission for Europe/United Nations Uniform provisions concerning the approval of vehicles with regard to the installation of lighting and light-signalling devices.
- Regulation No. 341/2014 Col. (CZ) Decree concerning the approval of technical ability and concerning the technical conditions of the authorising the use of vehicles for road traffic.





Part of the workplace for environmental influence testing (cold, dry heat, humidity)

Part of the workplace for EMC testing of the motor vehicles electric and electronic components

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EMC TEST SITE WORKPLACE FOR TESTS DEVELOPMENT

The workplace for tests development deals with:

- EMC laboratories development in the field of test methods;
- Creation of both the NATO and civilian sector standards too;
- Study of new knowledge in the area of the electromagnetic threats (HPM, UWB, NEMP, LEMP);
- Testing of HPM, UWB and NEMP effects;
- Modelling and simulation of the electromagnetic field effects from the point of view of technical and biological compatibility.



Workplace of the NEMP simulator



Workplace of the HPM testing



Solving of the EMC biologic systems problems with using of the computer modelling and simulation

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