RUAG TEST CENTER

Electromagnetic Compatibility

↗ Technical devices or systems must operate reliably. They need to be resistant to electromagnetic interference and may only emit sufficiently low levels of radiofrequency energy to meet the respective EMC requirements. The RUAG Test Center for Electromagnetic Compatibility (EMC) offers advice and comprehensive test procedures in accordance with established civil and military standards.

↗ Our Services

It is essential to know how a technical device or system performs under various electromagnetic influences. This is the only way to ensure that it operates as intended in its designated environment and thus offers first-class quality. Our EMC Test Center provides a wide range of consulting services in the field of electromagnetic compatibility. The scope includes the following services in particular:

- Advice on the choice of the appropriate EMC standards and limit values, depending on the respective object and its intended environment.
- Support in determining and defining specific pass/fail criteria. In immunity tests, these criteria are used to assess functional deviations from a defined target state.
- Advice on creating an EMC test plan based on the customers product information.
- Implementation of EMC tests according to civil and military scope of testing (pre- and full compliance).
- Advice and preparation of proposed solutions in case of EMC problems during the test phase with the aim of achieving an EMC-compliant design.
- Various risk and data analyses and corresponding recommendations.

↗ Your Benefits

Thanks to a state-of-the-art infrastructure, the EMC Test Center tests under standard-compliant conditions. Our customers benefit from maximum transparency and our high quality standards, supported by the standards set by the Swiss Accreditation Service (SAS). In addition, we work closely with partners for high voltage safety, lightning protection, inspection and acceptance. This ensures that you receive precise and complete results in a timely manner. Benefits for our customers:

- Extensive advice and tests in one place.
- Early detection of EMC problems and avoidance of excessive development costs and legal complications.
- Accurate results due to accredited measurement methods.
- Support for EMC-compliant designs.
- Maximum transparency and consistently high quality with cost-efficient implementation.

↗ LIFE CYCLE OF A SYSTEM

The life cycle of a system can be divided into different phases (see phase model according to EN 50126). It begins with conception and ends with decommissioning or disposal. System tests should be constant companions in the life cycle of a system in order to permanently meet quality requirements. The RUAG EMC Test Center advises and supports you during the various project phases.

Assessment of electromagnetic compatibility takes place during different phases of the systems life cycle. We support you all the way:

↗ CONCEPTION AND SPECIFICATION

- Assessment of system environment or limitations with respect to EMC.
- Determination of EMC risks.
- Establishment of system requirements, i.e. EMC requirements/ performance based on the system definition and application conditions.
- Determination of the applicable standards & limit values.

↗ DEVELOPMENT AND PRODUCTION

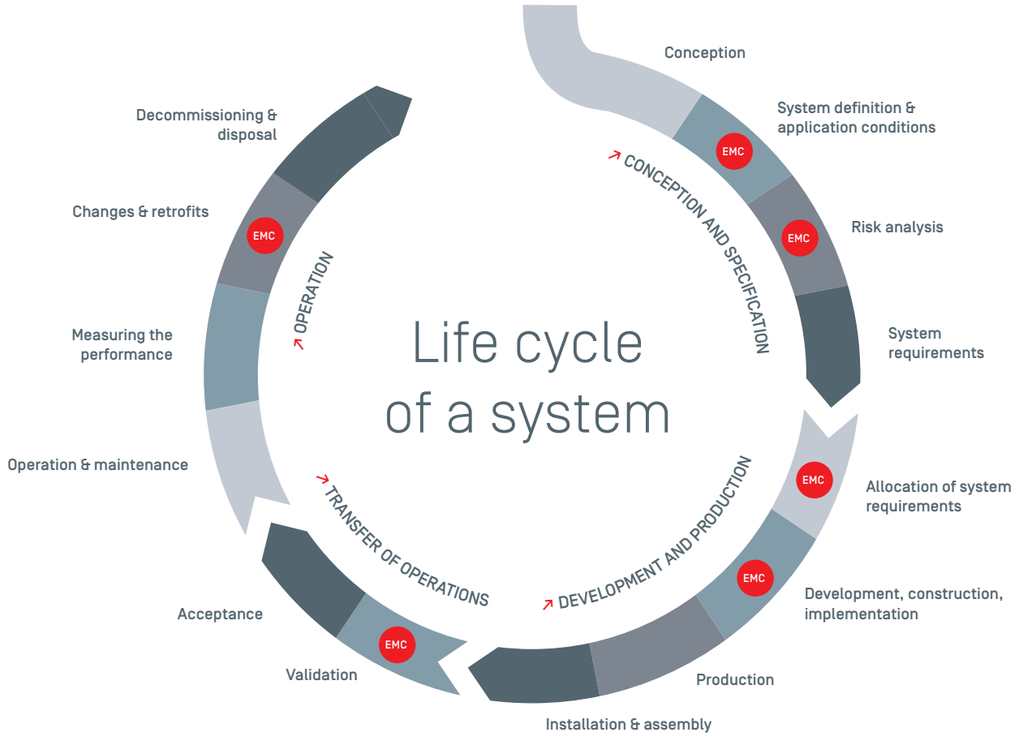
- For complex systems with subsystems/components already defined by the customer: Assessment of the required EMC performance for the EMC system test and/or expert opinion on existing EMC test results.
- For complex systems with subsystems/components to be defined: expertise to define the EMC requirements on subsystem level.
- Design, construct, implement: Engineering support in the design and implementation phase.
- Manufacture, install, assemble: Testing of the required EMC properties (“pre-compliance” test) at component or subsystem level including test report; engineering support to find solutions to any EMC problems that may arise.

↗ TRANSFER OF OPERATIONS

- Validation: Support with the creation of an EMC test plan.
- Acceptance: Testing of the required EMC properties (compliance test) & report.

↗ OPERATION

- Changes and upgrades: Assessment and, if necessary, testing of a system with respect to the fulfilment of EMC requirements after changes.



Applied Test Methods

THE EMC TEST CENTER CARRIES OUT THE FOLLOWING TESTS IN BOTH ACCREDITED AND NON-ACCREDITED SCOPE:

↗ SCOPE OF TESTING	↗ DESCRIPTION
– Radiated emission	– E field 10 kHz to 18 GHz – H field 30 Hz to 30 MHz – Measuring distance 3 m and 10 m
– Conducted emission	– Voltage and current, 5 Hz to 1 GHz – Flicker, harmonics
– Radiated immunity	– E field 10 kHz to 18 GHz (up to 200 V/m) – H field 20 Hz to 30 MHz (up to 180 dBpT) – H field mains frequency up to 1000 A/m
– Conducted immunity	– RF injection 30 Hz to 1 GHz – Burst, surge, ring wave, transient – Dips , interruptions and voltage variations
– Immunity to electrostatic discharges	– ESD up to 30 kV (contact- & air discharge)
– Regulatory testing of radiocommunications according to EN ETSI	– 863 MHz to 876 MHz, 2.4 GHz, 5 GHz and 6 GHz band (in prep.) – Wired tests (OTA in preparation) – Bluetooth (BT BR/EDR), Bluetooth Low Energy (BLE), WLAN (IEEE 802.11), Zigbee (IEEE 802.15.4), LoRaWAN,...
– On-board simulation of tactical systems	– 12 VDC / 24 VDC / 28 VDC systems – Normal & starting operation – Surges and spikes – Transient emissions
– Shielding effectiveness according to IEEE 299 and VG standards *no accreditation for SD examinations	– Enclosure 10 kHz to 18 GHz (up to 80 dB) – Cable 10 kHz to 500 MHz (up to 80 dB)
– Personal safety with respect to electromagnetic radiation (non-ionizing radiation protection) *no accreditation regarding personal safety (measurement of non-ionizing radiation)	– E field 10 kHz to 40 GHz – H field 300 kHz to 1 GHz

Applied test methods

- Civil standards: SN/ETSI/EN/ISO/CISPR/IEC standards
- Military standards: MIL-STD, VG standards (German defense basic standards), AECTP, DEF-STAN *no accreditation for VG standards and DEF-STAN / **partial accreditation to MIL-STD 461, AECTP 500
- Customer-specific test methods which may deviate from standards (on request)

Test objects: operation and monitoring

- EUT weight up to 75 t
- EUT monitoring via video, audio and standardized communication interfaces (LAN, CAN, USB, RS232, etc.)
- Power supply: filtered feedthroughs up to 1000 V, up to 400 A, from DC up to 400 Hz
- Compressed air supply
- Exhaust extraction
- Fresh water and waste water connection (fresh water up to 8 bar)

Accreditations & certifications

- Accredited test laboratory according to ISO/IEC 17025
- Accreditation number STS 0050
- Certified according to ISO 9001
- Laboratory personnel are screened and authorized in accordance with federal requirements regarding access to classified information, materials and equipment

↗ CONTACT US FOR YOUR PROJECT:

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