

Electromagnetic Compatibility Control Requirements Systems

RATIONALE

The document is still a valid standard which may benefit from a future update. The basic technology described in the document is still valid. The subcommittee designated to update the document is not currently active, so stabilization of the document is the best approach until such time as a committee can be established to open a WIP.

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1. SCOPE AND FIELD OF APPLICATION:

This SAE Aerospace Recommended Practice (ARP) establishes overall system electromagnetic compatibility (EMC) control requirements. EMC includes the following:

- a. Electromagnetic Environmental Effects (E³)
- b. Electrostatic Discharge (ESD)
- c. Electromagnetic Interference (EMI)
- d. Electromagnetic Vulnerability (EMV)
- e. Electromagnetic Pulse (EMP)
- f. Hazards of Electromagnetic Radiation to Ordnance (HERO)
- g. Hazards of Electromagnetic Radiation to Personnel (HERP)
- h. Hazards of Electromagnetic Radiation to Fuels (HERF)
- i. High Intensity Radiated Fields (HIRF)
- j. Lightning Protection
- k. Static Electricity
- l. TEMPEST

This document is intended to be used for the procurement of land, sea, air, or space systems by any procurement activity. Tailoring of specific requirements is necessary and Appendix A has been provided for guidance.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The applicable issue of the publications, or their successors, should be the issue in effect on the date of the purchase order. In the event of conflict between the text of this specification and references cited herein, the text of this specification takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 ANSI Publications:

Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ANSI C95.1 Safety Levels With Respect to Human Exposure to Radio frequency Electromagnetic Fields, 300 kHz to 100 GHz

2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-461	Electromagnetic Emission and Susceptibility, Requirements for the Control of Electromagnetic Interference
MIL-STD-462	Electromagnetic Interference Characteristics, Measurement of
MIL-STD-1385	Preclusion of Ordnance Hazards in Electromagnetic Field; General Requirements
MIL-STD-1512	Electro-explosive Subsystems, Electrically Initiated Test Methods and Design Requirements
MIL-STD-1686	Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment Excluding Electrically Initiated Explosive Devices (Metric)
MIL-STD-1757	Lightning Qualification Test Techniques for Aerospace Vehicles and Hardware
MIL-STD-1795	Lightning Protection of Aerospace Vehicles and Hardware
MIL-STD-1818	Electromagnetic Effects Requirements for Systems
MIL-STD-2169	High Altitude Electromagnetic Pulse (HEMP) Environment
MIL-HDBK-238	Electromagnetic Radiation Hazard
DOD-HDBK-263	Electrostatic Discharge Control Handbook for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices) Metric
MIL-HDBK-419	Grounding, Bonding, and Shielding for Basic Theory - Volume 1 Electronic Equipments and Facilities Applications - Volume 2

2.3 Applicable References:

NACSIM 5100A Compromising Emanations Laboratory Test Requirements, Electromagnetics

2.4 Definitions:

- 2.4.1 EMCAB (Electromagnetic Compatibility Advisory Board): The EMCAB is an EMC Advisory Board, established by the procuring activity for the control, review, advice, technical consultation and other assistance as may be required on EMC matters during the design and procurement of major systems.
- 2.4.2 EME (Electromagnetic Environment): The power and time distribution, in appropriate frequency ranges, of the electromagnetic levels which may be encountered by an equipment, subsystem or system when performing its assigned mission. The EME is normally expressed in terms of field strength or power density.
- 2.4.3 EMC (Electromagnetic Compatibility): Ability of electronic/electrical equipments, subsystems, and systems to operate in their intended operational environments without suffering or causing unacceptable degradation due to EMI.