



Standard Test Method for Electromagnetic Shielding Effectiveness of Durable Rigid Wall Relocatable Structures¹

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This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This test method covers the determination of the electromagnetic shielding effectiveness of durable relocatable shielded enclosures.

1.1.1 The intended application of this test method is for virgin shielded enclosures that do not have any equipment or equipment racks. It is recommended that tests be conducted before the interior finish work begins. However, the shield assembly including all enclosure penetrations shall be completed and required penetration protection devices shall be installed in accordance with the design specification. The test method can also be used on existing shielded enclosures after repair work is done to verify workmanship, but it may be necessary to remove equipment or equipment racks to gain access to a test area.

1.1.2 The test procedures delineated in this document are comprehensive and may require several days to complete for a room-size shielded enclosure. A user can apply this test method for a first article test that requires proof of concept and validation of design and fabrication technique. **Appendix X2** provides guidance on choosing test points so shielding effectiveness tests on a room-size shielded enclosure may be completed in about one-half day for which it applies to shielded enclosures coming off an assembly line.

1.2 This test method is for use in the following frequency ranges: 140 to 160 kHz, 14 to 16 MHz, 300 to 500 MHz, 900 to 1000 MHz, and 8.5 to 10.5 GHz. Specific test frequencies within these ranges are required (see **11.1.1** and **11.2.1**). Additional measurements in the range of 10 kHz to 10.5 GHz may be performed. For specific applications, the frequency range may be extended from 50 Hz to 40 GHz. **Appendix X1** provides guidance on selecting measurement frequencies.

1.3 This test method is not applicable to individual components such as separate walls, floors, ceilings, or shielded racks.

1.4 This standard may involve hazardous materials, operations, equipment, or any combination.

1.5 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

E631 Terminology of Building Constructions

E1749 Terminology Relating to Rigid Wall Relocatable Shelters

2.2 IEEE Standards:³

IEEE Std 299-1997 IEEE Standard Method for Measuring the Effectiveness of Electromagnetic Shielding Enclosures

IEEE Std C95.1-1991 IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz

2.3 Military Standard:⁴

MIL-STD-188-125 High Altitude Electromagnetic Pulse (HEMP) Protection for Ground Based C⁴I Facilities Performing Critical, Time-Urgent Missions

2.4 OSHA Standard:⁵

OSHA Regulation, 29 CFR 1910, Department of Labor, July 1992

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., Piscataway, NJ 08854-4141, <http://www.ieee.org>.

⁴ Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

⁵ Available from Occupational Safety and Health Administration (OSHA), 200 Constitution Ave., NW, Washington, DC 20210, <http://www.osha.gov>.

¹ This test method is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.53 on Materials and Processes for Durable Rigidwall Relocatable Structures.

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