



Designation: F2401 – 24

Standard Guide for Security Checkpoint Screening of Persons with Medical Devices Using Metal Detectors¹

This standard is issued under the fixed designation F2401; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 The following guide addresses persons with personal medical electronic devices (PMEDs), which may be implanted, active, medical devices or active ambulatory medical devices, as well as passive implanted medical devices, while maintaining the integrity of the security checkpoint.

1.2 PMEDs are being used to prolong and improve quality of life. Although PMEDs are typically designed to operate in the electromagnetic environment experienced in daily life, there is a potential for the disruption of or damage to, or both, active PMED function when exposed to certain electromagnetic fields emitted by commonly encountered electrically powered products, including handheld and walk-through metal detectors used in security checkpoint screening. In addition, some PMEDs may trigger an unintended alarm of the metal detector.

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

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This guide is under the jurisdiction of ASTM Committee F12 on Security Systems and Equipment and is the direct responsibility of Subcommittee F12.60 on Controlled Access Security, Search, and Screening Equipment.

Current edition approved Oct. 1, 2024. Published October 2024. Originally approved in 2004. Last previous edition approved in 2016 as F2401 – 16. DOI: 10.1520/F2401-24.

2. Referenced Documents

2.1 ISO Standards:²

ISO 14117 Active implantable medical devices – Electromagnetic compatibility – EMC test protocols for implantable cardiac pacemakers, implantable cardioverter defibrillators, and cardiac resynchronization devices

ISO 14708-1 Implants for surgery – Active implantable medical devices – Part 1: General requirements for safety, marking and for information to be provided by the manufacturer

ISO 14708-2 Implants for surgery – Active implantable medical devices – Part 2: Cardiac pacemakers

ISO 14708-3 Implants for surgery – Active implantable medical devices – Part 3: Implantable neurostimulators

ISO 14708-4 Implants for surgery – Active implantable medical devices – Part 4: Implantable infusion pumps

ISO 14708-5 Implants for surgery – Active implantable medical devices – Part 5: Circulatory support devices

ISO 14708-6 Implants for surgery – Active implantable medical devices – Part 6: Particular requirements for active implantable medical devices intended to treat tachyarrhythmia (including implantable defibrillators)

ISO 14708-7 Implants for surgery – Active implantable medical devices – Part 7: Particular requirements for cochlear implant systems

3. Terminology

3.1 Definitions:

3.1.1 *electromagnetic field, n*—when referenced in this guide, it describes the energy field created by the metal detector as a means to produce a response to materials with electrical conductivity or magnetic susceptibility, or both; the electromagnetic fields used in metal detectors for security screening applications are typically low frequency and vary with time and locations.

3.1.2 *handheld metal detector, n*—portable metal detector product used by a security screener to provide localized searches of a person.

² Available from International Organization for Standardization (ISO), ISO Central Secretariat, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <https://www.iso.org>.

3.1.3 *personal medical electronic device (PMED)*, *n*—medical devices, usually employing electronic circuitry, for human physiological monitoring or to deliver medical treatment or therapy such as drugs or electrical stimulation; these devices can be implanted, worn, or both, and may be powered (active) or not powered (passive).

3.1.4 *security checkpoint*, *n*—access location equipped with personnel and screening devices used as a means to control the flow of weapons or contraband material, or both.

3.1.5 *security screener*, *n*—trained person performing the necessary screening functions at a security checkpoint.

3.1.6 *walk-through metal detector (WTMD)*, *n*—a stationary metal detector that provides a search of the entire body of a person as they pass through the portal of the WTMD.

3.1.7 *WTMD portal*, *n*—the space between the columns of a WTMD, where these columns may or may not have a common horizontal structure connecting them.

4. Summary of Guide

4.1 This guide provides suggestions to identify, evaluate, and screen persons with PMEDs and report incidences involving medical device users.

4.2 These suggestions include security checkpoint layout, signage, screening procedures, screener training, and information for the medical community (physicians, nurses, device manufacturers, PMED users, and so forth) about checkpoint security procedures to encourage the standardization of information and media provided to persons with PMEDs.

5. Significance and Use

5.1 This guide addresses the design, configuration, and operation of security checkpoints to minimize exposure of persons with PMEDs to the electromagnetic fields emitted by metal detector security systems. Guidance is presented for signage and information to help identify persons with PMEDs and process them through the security checkpoint.

5.2 This guide may help in the training of checkpoint screeners to address the concerns of persons with PMEDs and to respond to their needs.

5.3 This guide may aid the medical community in advising PMED users who may be affected to identify themselves at security checkpoints so their concerns may be addressed.

6. Procedure

6.1 *Checkpoint Layout*—The security checkpoint should be arranged and configured to minimize the exposure of people with PMEDs to the metal detector emissions. This may be facilitated by free traffic flow through the security checkpoint, which in turn minimizes the duration of time a person remains inside the WTMD portal. To accomplish this checkpoint layout, the following points should be considered.

6.1.1 Provide an area for divestiture of metallic objects before screening.

6.1.2 Provide identifiable queuing area for the human traffic flow through the security checkpoint. The traffic start point should be at least 30 cm before the WTMD portal.

6.1.3 Provide a path of free flow to ensure that no distractions or obstructions prevent a person from freely passing through the WTMD portal unhindered. A distance of at least 1 m from the WTMD portal, where stopping for hand inspection of parcels or retrieving items from the baggage screening x-ray system, is recommended.

6.1.4 Provide no-standing zones of at least 40 cm on each side of the WTMD for security personnel.

6.1.5 Provide a secondary screening area for manual scanning with a handheld metal detector or hand searching, or both, as provided by the security policy.

6.1.6 Provide a means for bypass of the WTMD directly to the secondary screening area, if allowed by security policy.

6.2 *Signage*—Typically security checkpoint WTMDs are visible and identifiable. Signage is suggested to alert persons with concerns about their PMEDs and direct them to security staff for assistance. Example text for signage is “Metal detector in use. Persons with medical electronic devices should notify security personnel including any known restrictions for their medical devices.”

6.3 *Reporting*—Incidents of PMED disruption from exposure to the security equipment that result in injury to or complaint from the PMED user should immediately be reported to the security personnel, preferably to the checkpoint supervisor. Information about the incident should be recorded with as much of the following information as appropriate and available under the circumstances.

6.3.1 Date, time, and location of incident (for example, facility name or address and security checkpoint location).

6.3.2 *Security Equipment and Personnel Involved*—Type of equipment (for example, handheld metal detector or walk-through metal detector), manufacturer, model, model number, serial number, and settings.

6.3.3 *PMED User Information*—Name, address, telephone number, e-mail, PMED user age, sex, height, weight, and if available, PMED user’s physician’s name and contact information.

6.3.4 *Medical Device Information*—As much detail about the PMED as possible, including the medical device type (for example, type, make, model, and serial number), device location on or implanted in body, and medical device settings (if known). A photocopy of the PMED user’s medical device implant identification card (if available) may provide some portion of this information.

6.3.5 *Summary of Incident*—A description of what happened, including communication with the PMED user before, during, and after the incident. For WTMDs, how long the PMED user was in the WTMD portal, and for handheld metal detectors, how long the detector was held over or near the PMED location and at what distance. A figure of the PMED user and screening equipment showing the PMED user location and direction is useful.

6.3.6 *PMED User Complaint*—Summary description of what the PMED user experienced and when, and what the consequences of the incident were for the PMED user and PMED.

6.3.7 Any communications with the PMED user’s physician after the event.