Designation: E2458 – 26

Standard Practices for Bulk Sample Collection and Swab Sample Collection of Visible Powders Suspected of Being Biological Agents and Toxins from Nonporous Surfaces[1]

This standard is issued under the fixed designation E2458; 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 These practices cover the collection of visible powders that are suspected biological agents and toxins from solid nonporous surfaces using a bulk collection method, using a dry swab and laminated card, followed by a swab sampling method using a sterile moistened swab. Bulk powder samples are collected and packaged in a manner that permits the maximum amount of the sample to be safely transported to a reference laboratory within the Centers for Disease Control and Prevention (CDC) national Laboratory Response Network (LRN)[2] for confirmatory identification and safe storage. If the source of the powder is a letter or small package, that item is also packaged in a manner that permits it to be safely transported to an LRN reference laboratory. A sterile moistened swab may be used to collect residual powder from the nonporous surface and may be used to conduct on-site biological assessments for the purpose of testing for biological agents and toxins.

1.2 These practices are performed in coordination with the Federal Bureau of Investigation (FBI) as part of a risk assessment including hazard assessment and threat credibility evaluation as recommended and clarified in Guide E2770. The decision to implement these practices and collect a public safety sample will be made by members of the response community of the jurisdiction assuming responsibility through coordination with the FBI and the receiving LRN reference laboratory.

1.3 Sample Collection Method A covers the bulk collection and packaging of suspicious visible powders that are suspected biological agents and toxins from solid nonporous surfaces. All samples suspected to be biological agents and toxins on nonporous surfaces should be collected according to Sample Collection Method A and sent to an LRN reference laboratory for confirmatory testing.

1.4 Sample Collection Method B covers swab sampling of residual suspicious powders that are suspected biological agents and toxins from solid nonporous surfaces. Swab samples can be used for on-site biological assessment; however results from on-site biological assessments are not definitive; confirmatory testing by the LRN reference laboratory is necessary to make public health decisions.

1.5 These practices incorporate reference guidance for packaging and transport of suspicious visible powders to comply with all appropriate federal regulations regarding biosafety and biosecurity.

1.6 These practices should only be used to collect visible samples that are suspected biological agents and toxins and have been field screened according to reference guidance for explosive hazard, radiological hazard, and other acute chemical hazards.

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

1.8 *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.*

1.9 *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] These practices are under the jurisdiction of ASTM Committee E54 on Homeland Security Applications and are the direct responsibility of Subcommittee E54.01 on CBRNE Detection and CBRN Protection.

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[2] The CDC Laboratory Response Network is the network responsible for handling clinical specimens and environmental samples containing suspected biothreat agents.

2. Referenced Documents

2.1 *ASTM Standards:*[3]

E2770 Guide for Operational Guidelines for Initial Response to Suspected Biological Agents and Toxins

2.2 *Federal Government Regulations:*[4]

18 USC 175 Prohibitions with Respect to Biological Weapons

18 USC 178 Prohibitions with Respect to Biological Weapons - Definitions

50 USC 2302 War and National Defense Definitions

DOT 49 CFR, Parts 171-180 Hazardous Materials Regulations

DOT - 49 CFR 172 Subpart H, Training

DOT - 49 CFR 173 Shippers—General Requirements for Shipments and Packagings

DOT - 49 CFR 178 Specifications for Packagings

EPA - 40 CFR 300 National Oil and Hazardous Substances Pollution Contingency Plan (NCP)

EPA - 40 CFR 311 Worker Protection

NRC - 10 CFR 20 Standards for Protection against Radiation

NIOSH - 42 CFR 84 Approval of Respiratory Protective Devices

OSHA - 29 CFR 1910 Subpart Z and 29 CFR 1926 Subpart Z Toxic and Hazardous Substances

OSHA - 29 1910.1096 and 29 CFR 1926.53 Ionizing Radiation

OSHA - 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (HAZWOPER)

OSHA - 29 CFR 1910 Subpart I (Sections 132 to 139) Personal Protective Equipment (PPE)

OSHA - 29 CFR 1910.1200 Hazard Communication

2.3 *Federal Guidance:*

OSHA - CPL 02-02-073 Inspection Procedures for 29 CFR 1910.120 and 1926.65, Paragraph (q): Emergency Response to Hazardous Substance Releases[5]

OSHA – CPL 02-02-071 Technical Enforcement and Assistance Guidelines for Hazardous Waste Site and RCRA Corrective Action Clean-up Operations[5]

NIOSH Publication No. 2009-132 Recommendations for the Selection and Use of Respirators and Protective Clothing for Protection Against Biological Agents[6]

FBI Laboratory Publication Handbook of Forensic Services 2019[7]

FBI-DHS-HHS/CDC Coordinated Document Guidance on Initial Response to a Suspicious Letter/Container with a Potential Biological threat, November 2, 2004[8]

CDC/NIOSH Surface Sampling Procedures for *Bacillus anthracis* Spores from Smooth, Non-porous Surfaces, April 26, 2012[9]

DHS Framework for a Biothreat Field Response Mission Capability, April 2011[10]

Sandia National Laboratories SAND2005-3237 (LBNL-54973 (II)) Guidelines to Improve Airport Preparedness Against Chemical and Biological Terrorism[11]

NIMS 2017 National Incident Management System[12]

2.4 *NFPA Standards:*[13]

NFPA 470 Hazardous Materials/Weapons of Mass Destruction (WMD) Standard for Responders

NFPA 1994 Standard on Protective Ensembles for Chemical/Biological Terrorism Incidents

2.5 *IATA Standards:*[14]

IATA PI 602 Infectious Diseases (Infectious Substances), 2012

IATA PI 650 Shipping of Diagnostic Samples, 2023

IATA DGR 66th Edition, 2025 and associated Addendums

2.6 *ANSI Standards:*[15]

ANSI Z87.1-2020 American National Standard for Occupational and Educational Personal Eye and Face Protection Devices

ANSI Z88.2-2015 American National Standard Practices for Respiratory Protection

ANSI Z88.10-2010 American National Standard – Respirator Fit Testing Methods

ANSI/ISEA Z89.1-2014 (R2019) American National Standard for Industrial Head Protection

ANSI/Compressed Gas Association, CGA G-7.1-2018 Commodity Specification for Air

2.7 *IAFC Guidance:*[16]

Model Procedures for Responding to a Package with Suspicion of a Biological Threat, October 2008

3. Terminology

3.1 *Definitions:*

3.1.1 *aseptic technique, n*—operation or performance of a procedure or method under carefully controlled conditions to reduce the risk of exposure and prevent the introduction of unwanted material/matter (contamination) into a sample.

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

[4] Available from U.S. Government Publishing Office (GPO), 732 N. Capitol St., NW, Washington, DC 20401, http://www.gpo.gov., and also available online from Occupational Safety and Health Administration (www.osha.gov).

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

[6] Available from https://www.cdc.gov/niosh/docs/2009-132/default.html.

[7] Available from https://www.fbi.gov/file-repository/laboratory/handbook-of-forensic-services-pdf.pdf/view.

[8] Available from https://www.health.state.mn.us/diseases/idlab/labep/hazmat/suspiciouspackagebiothreat.pdf.

[9] Available from https://www.cdc.gov/niosh/anthrax/php/surface-sampling/index.html.

[10] Available from http://www.hsdl.org/?view&did=767721.

[11] Available from http://share-ng.sandia.gov/news/resources/releases/2005/images/unlsand-2005-3237.pdf.

[12] Available from Federal Emergency Management Agency (FEMA), 500 C St., SW, Washington, DC 20472, http://www.fema.gov.

[13] Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269-9101.

[14] Available from the International Air Transport Association, 800 Place Victoria, PO Box 113, Montreal-H4Z 1M1, Quebec, Canada.

[15] Available from American National Standards Institute (ANSI), 1180 Avenue of the Americas, 10th Floor, New York, NY 10036, http://www.ansi.org.

[16] Available from International Association of Fire Chiefs (IAFC), 4025 Fair Ridge Drive, Suite 300 Fairfax, VA 22033, http://www.iafc.org.