



Standard Specification for Handheld Point Chemical Vapor Detectors (HPCVD) for Homeland Security Applications¹

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1. Scope

1.1 General:

1.1.1 This document presents baseline performance requirements and additional optional capabilities for handheld point chemical vapor detectors (HPCVD) for homeland security applications. This document is one of several that describe chemical vapor detectors (for example, handheld, and stationary) and chemical detection capabilities including: chemical vapor hazard detection, identification, and quantification. An HPCVD is capable of detecting and alarming when exposed to chemical vapors that pose a risk as defined by the Acute Exposure Guideline Levels for Selected Airborne Chemicals (AeGL).

1.1.2 This document provides the HPCVD baseline requirements, including performance, system, environmental, and documentation requirements. This document provides HPCVD designers, manufacturers, integrators, procurement personnel, end users/practitioners, and responsible authorities a common set of parameters to match capabilities and user needs.

1.1.3 This document is not meant to provide for all uses. Manufacturers, purchasers, and end users will need to determine specific requirements including, but not limited to, use by HAZMAT teams, use in explosive atmospheres, use with personal protective equipment (PPE), use by firefighters and law enforcement officers, special electromagnetic compatibility needs, extended storage periods, and extended mission time. These specific requirements may or may not be generally applicable to all HPCVDs.

1.2 *Operational Concepts*—HPCVDs are used to detect, identify, and/or quantify chemical vapor hazards that pose 30-min Acute Exposure Guideline Level-2 (AeGL-2) dangers. The HPCVD should not alarm to environmental background chemical vapors and should provide low false positive alarm rates and no false negatives. Uses of an HPCVD include search and rescue, survey, surveillance, sampling, and temporary

fixed-site monitoring. An HPCVD should withstand the rigors associated with uses including, but not limited to, high- and low-temperature use and storage conditions; shock and vibration; radio frequency interference; and rapid changes in operating temperature, pressure, and humidity.

1.3 *HPCVD Chemical Detection Capabilities*—Manufacturers document and verify, through testing, the chemical detection capabilities of the HPCVD. Test methods for assessing chemical detection capabilities are available from the Department of Homeland Security and the Department of Defense and are listed in [Appendix X3](#).

1.4 *HPCVD System and Environmental Properties*—Manufacturers document and verify, through testing, the system and environmental properties of the HPCVD. Example test methods for assessing the system and environmental properties are listed in [Appendix X4](#).

1.5 *Units*—The values stated in SI units are to be regarded as the standard. Vapor concentrations of the hazardous materials are presented in parts per million (ppm) as used in *Acute Exposure Guideline Levels for Selected Airborne Chemicals*, Vols 1-9 (see [2.1](#)) and in mg/m³.

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 *Acute Exposure Guideline Levels:*

[Acute Exposure Guideline Levels for Selected Airborne Chemicals, Vols 1-9](#)²

2.2 *Code of Federal Regulations:*³

[CFR Title 40 Protection of the Environment, Part 72.2 Permits Regulation, Definitions](#)

¹ This specification is under the jurisdiction of ASTM Committee E54 on Homeland Security Applications and is the direct responsibility of Subcommittee E54.01 on CBRNE Sensors and Detectors.

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² Committee on Acute Exposure Guideline Levels, Committee on Toxicology, Board on Environmental Studies and Toxicology, Division on Earth and Life Studies, National Research Council of the National Academies; 2000-2010, <http://www.epa.gov/oppt/aegl/index.htm>, updated August 2010.

³ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.