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Filters and Adsorbents

Personal gas masks and filtering systems are the warfighter's first line of defense against airborne chemical threats. Currently fielded masks use ASZM-TEDA activated carbon in C2A1 and M61 filters to reduce exposure to chemical warfare agents. PETB conducts first article, production lot and surveillance testing for these products and other manufactured protection items, pictured below.



Dedicated Testing

- Gas chromatographs with FID FPD and TCD detectors to provide gas life performance against cyanogen chloride (CK), hydrogen cyanide (AC), cyanogen (CN), phosgene (CG) and dimethyl methylphosphonate (DMMP) in a modified Q95 or Q250 configuration
- Infrared photoacoustic technology for near real time monitoring of gross level challenge vapor and comprehensive data acquisition of environmental conditions
- Inductively Coupled Plasma Optical Emissions Spectrometry (ICP-OES) for detection and quantification of trace metals to parts per billion
- Liquid extraction apparatus for TEDA content analysis
- pH level determinations of filtration media and ammonia content analysis with a modified Q3 system
- Physical properties of particulates, to include:
 - Apparent Density
 - % Moisture Content
 - Particle Size and Hardness

Customized Testing

- New Adsorbent Materials: Specific testing parameters and additional data acquisition were provided for a filter manufacturer developing an experimental adsorbent made from coconuts.
- Filter Performance Post-Decontamination: Part of an ongoing Acquisition Program, fielded filter types were treated and tested to see how a new decontamination delivery system would affect chemical breakthrough results.
- Humidification Effects on Carbon Performance: Exploratory study for Rock Island on varying levels of environmental conditioning and its effect on CK and DMMP gas life performance.
- Supporting active military facility filtration systems: Field sampling of in-use air intake filters as well as surveillance testing by CK gas life performance.

Ask us how we can design a test for you!

SMARTMAN

Verifying all components of a mask is the most critical step in certifying a respiratory protection system. The Simulant Agent Resistant Test Manikin (SMARTMAN) test system allows for liquid and vapor chemical agent testing on complete respiratory systems simulating a variety of environmental conditions, such as heat and humidity, at a variety of breathing rates.



In fiscal year 2015, PETB has performed extensive developmental, validation and certification testing with NIOSH on over 120 respiratory systems from companies such as North, Dräger, Honeywell, Avon, MSA, Scott and Interspiro.

Qualitative and Quantitative Permeation



PETB provides first article, production lot acceptance, surveillance, and developmental testing of permeable, semi-permeable and impermeable protective materials against chemical agent liquid and vapor challenge. High throughput and low cost are an ideal option for large quantities of any material, to include boots, gloves, fabrics, air intake hoses and emergency response protective suits. Below are some of the test methods found in MIL-DTL-282 that are readily available.

Proven Testing

STATIC DIFFUSION

- Test Method 208, 209: single flow, 12-cell closed system in which liquid agent is applied directly to sample material and effluent flow is monitored by MINICAMs.
- Test Method 204: known as the Q170, a temperature controlled chamber where sample material is laid on a swatch of contrasting detection paper and liquid agent is applied directly to the sample, then monitored for colorimetric breakthrough.
- Test Method 206: known as the Q171, a closed system in which liquid agent is applied directly to the sample material and breakthrough results are recorded as a function of fruit fly cessation.

DYNAMIC DIFFUSION

- TOP 8-2-501: A dual-flow, 12-cell closed system in which liquid agent with cross air flow is applied directly to sample material and effluent flow is monitored by MINICAMs.

CONVECTIVE DIFFUSION

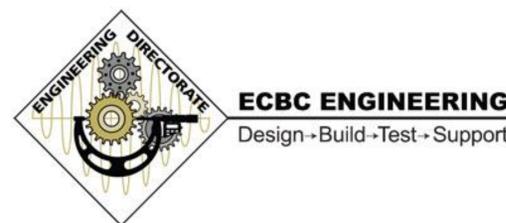
- TOP 8-2-501: A 12-cell closed system in which agent vapor is generated and introduced in laminar flow and pulled through sample material while effluent flow is monitored by MINICAMs.

Comprehensive Testing

As part of first article testing on the M50/M51 Mask, the shading outsert lenses of the mask were exposed to twenty-two battlefield contaminants and recorded for blistering, cracking or other signs of damage. Common chemicals found in warfighter environments but not typical in laboratory settings had to be obtained for this testing. These include aircraft turbine engine synthetic lube oil, JP8 fuel, and insect repellent. PETB writes test plans to fit your testing needs.



Bleach Certification: PETB also verifies your available chlorine for decontamination!



Protective Equipment Test Branch (PETB)
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