

**National Personal Protective
Technology Laboratory**

**Standards Development Effort of
the Concept Standard for CBRN,
Full Facepiece, CC-SCBA**

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Purpose

- **To discuss the special requirements and updates of the Concept Standard for CBRN CC-SCBA**
- **Concept Standard:**
 - Special Requirements for CBRN Use
 - High Radiant Heat and Open Flame Resistance Requirements
- **Both sets are required to obtain CBRN Certification**



Special Requirements for CBRN Use

- **Operational Performance**
- **Environmental Temperature Operational Performance**
- **Vibration Endurance**
- **Accelerated Corrosion Resistance**
- **Particulate Resistance**
- **Facepiece Lens Haze, Luminous Transmittance, and Abrasion Resistance**
- **Communications Performance**
- **Chemical Agent Permeation and Penetration Resistance Against Distilled Mustard (HD) and Sarin (GB) Agent**
- **Laboratory Respiratory Protection Level (LRPL)**

Operational Performance Requirement

- **Must meet the requirements of Table 1**
- **Requirement Changes**
 - Test Functionality of End Of Service Life (ESLI) alarms and any monitoring systems
 - Not required to operate for the rated duration period established under 42 CFR 84.100 while following the protocol in Table 2b
 - Test is to determine functionality not duration
- **Will be tested in accordance with (IAW) the NIOSH Standard Test Procedure (STP) for operating the NIOSH Automated Breathing and Metabolic Simulator (ABMS) which is under development**

Environmental Temperature Operational Performance Requirement

- **Requirement Changes**

- Breathing Gas Wet-bulb temperature in Table 1 was waived during Hot and Hot Temperature Shock tests
- Cold temperature operational limit shall be established by CC-SCBA manufacturer
- Replace CO₂ absorbent material and coolant mechanism IAW manufacturer's instructions between cold and hot temperature shock tests
 - Rationale: Degradation of absorbent and coolant mechanism during soak periods of extreme temperature
 - Challenge: May be difficult to replace absorbent and coolant within the 3 minute requirement between conditions

Vibration Endurance Requirement

- **Requirement Changes**

- The O₂ bottle shall be empty (0 Gauge Pressure) during the vibration portion of the test
 - Rationale: Inconsequential weight difference between a full and an empty bottle to effect test outcome
 - Less than 1.75 lbs weight difference

CBRN Requirements with No Changes

- Accelerated Corrosion Resistance
- Particulate Resistance
- Facepiece Lens Haze, Luminous Transmittance, and Abrasion Resistance
- Communications Performance Requirement
- Laboratory Respiratory Protection Level (LRPL)

Develop NIOSH STPs to Test Requirements

- Testing will be conducted IAW NIOSH STPs that will be based on NFPA 1981 Standard, 2002 edition for the following requirements:
 - Accelerated Corrosion Resistance
 - Particulate Resistance
 - Facepiece Lens Haze, Luminous Transmittance, and Abrasion Resistance
 - Communications Performance Requirement
 - Vibration Endurance
- Rationale: NIOSH STPs can be updated to reflect the latest changes of the NFPA 1981 Standard

Chemical Agent Permeation and Penetration Resistance Against Distilled Mustard (HD) and Sarin (GB) Agent

- **Requirement Changes**

- Test Functionality of ESLI alarms and any monitoring systems
- The O₂ and CO₂ concentrations in the breathing gas will not be monitored after the CC-SCBA meets the rated duration period established under 42 CFR 84.100. by the applicant
- Decay rate of vapor challenge will follow the same decay profile as the NIOSH CBRN Open-Circuit SCBA Standard
- Test airflow rate (30 L/min): Volume measured at Standard Temperature = 0°C and Pressure Dry = 760 mm HG (STPD)

High Radiant Heat and Open Flame Resistance Requirements

- **Fabric Flame Resistance**

- No requirement or test method change

- **Fabric Heat Resistance**

- No requirement or test method change

- **Thread Heat Resistance**

- No requirement or test method change

- **Testing will be conducted IAW NIOSH STPs that will be based on the NFPA 1981 Standard, 2002 edition**

- Rationale: The NIOSH STPs can be updated to reflect the latest changes of the NFPA 1981 Standard

Heat and Flame Resistance Performance

- **Requirement Changes**
 - At this time, NIOSH will use a breathing machine to test this requirement and not the ABMS
 - Only the minimum and maximum breathing gas pressure requirements in Table 1 of Section 3.1 shall be met
 - Rationale: Difficult to integrate the ABMS with the NFPA Open Flame Test Apparatus and dangerous to test with a full O₂ bottle
- **Testing will be IAW a NIOSH STP that will be based on the NFPA 1981 Standard, 2002 edition**
 - Rationale: The NIOSH STP can be updated to reflect the latest changes to the latest NFPA 1981 Standard

Questions

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