

**Test Sequence and Required Quantity  
For  
CBRN Air-Purifying Escape Respirator**

Mr. Frank Palya, NIOSH  
25 June 2003



# Air-Purifying Escape Test Sequence and Quantity

Test Order	Resistance and Breathing Gas	Human Factors	Service Life, 100 lpm	Service Life, 64 lpm	Penetration and Permeation Testing	Efficiency Particulate	LRPL Test
Qty	12	3 - 9	30	60	6	20	30 - 65
1.	Inhalation Resistance	Field of View	Hot Constant Storage	Hot Constant Storage	Hot Constant Storage	Hot Constant Storage	Donning
2	Exhalation Resistance	Fogging	Cold Constant Storage	Cold Constant Storage	Cold Constant Storage	Cold Constant Storage	LRPL
3	Breathing Gas	Flammability and Heat Resistance	Humidity	Humidity	Humidity	Humidity	
4.			Transport. / Vibration	Transport. / Vibration	Transport. / Vibration	Transport. / Vibration	
5.			Drop	Drop	Drop	Drop	
6.			Service Life 100 lpm	Service Life 64 lpm	Live Agent System Testing	Filter Efficiency 42 CFR 84: 170, 179 and 181	
7.					Note: 2 units tested before Environ / Trans. / Vib.		

# Resistance and Breathing Gas

Quantity Required	Test	Test Method
Total 12		
3	Inhalation Resistance	42 CFR § 84.122
3	Exhalation Resistance	42 CFR § 84.122
12	Breathing Gas Concentration	Human Subject Testing

- Note:
1. Same Respirators will be used for all tests;
  2. Tests shall be performed as listed, top to bottom

# Human Factors

Quantity	Test	Test Method
Total 3 - 9		
1 - 3	Field of View	NIOSH: CET-APRS-STP- CBRN-0312
3 - 9	Fogging	NIOSH: CET-APRS-STP- CBRN-0321
2	Flammability and Heat Resistance	Equipment IAW EN 136:1998

- Note:
1. Same Respirators will be used for all tests;
  2. Tests shall be performed as listed, top to bottom.



# Gas Service Life (100 lpm)

Quantity Required	Test	Test Method
30	High Temperature Storage	MIL-STD-810F, Method 501.4 71°C (160°F) Constant; 5 Weeks
30	Low Temperature Storage	MIL-STD-810F, Method 502.4. -31 °C/(- 24 °F) Constant; 3 Days
30	Humidity	MIL-STD-810E, Method 507.3 Natural, Cycle 1, Quick Look.
30	Transportation / Vibration	MIL-STD-810F, Method 514.5. U.S Highways; 3 Axes; 12 Hrs/Axis
30	Drop	3 Foot Drop; 1 Drop per Axis
3 per Gas; 10 Gases	Service Life	100 lpm at 50% Relative Humidity per Section 2(b)



## Gas Service Life (64 Ipm)

Quantity	Test	Test Method
60	High Temperature Storage	MIL-STD-810F, Method 501.4 71°C (160°F) Constant; 5 Weeks
60	Low Temperature Storage	MIL-STD-810F, Method 502.4. -31 °C/(- 24 °F) Constant; 3 Days
60	Humidity	MIL-STD-810E, Method 507.3 Natural, Cycle 1, Quick Look.
60	Transportation / Vibration	MIL-STD-810F, Method 514.5. U.S Highways; 3 Axes; 12 Hrs/Axis
60	Drop	3 Foot Drop; 1 Drop per Axis
6 per Gas; 10 Gases	Service Life	3 at 25% and 3 at 80% RH per Section 2(b)

# Penetration and Permeation Testing

Quantity: 6 Total	Test	Test Method
2	Permeation and Permeation	Similar to NIOSH APR Gas Mask GB and HD Live Agent Test
4	High Temperature Storage	MIL-STD-810F, Method 501.4 71°C (160°F) Constant; 5 Weeks
4	Low Temperature Storage	MIL-STD-810F, Method 502.4. -31 °C (- 24 °F) Constant; 3 Days
4	Humidity	MIL-STD-810E, Method 507.3 Natural, Cycle 1, Quick Look.
4	Transportation / Vibration	MIL-STD-810F, Method 514.5. U.S Highways; 3 Axes; 12 Hrs/Axis
4	Drop	3 Foot Drop; 1 Drop per Axis
4	Permeation and Permeation	Similar to APR Gas Mask GB and HD Live Agent Test

# Filter Particulate Efficiency

Quantity	Test	Test Method
20	High Temperature Storage	MIL-STD-810F, Method 501.4 71°C (160°F) Constant; 5 Weeks
20	Low Temperature Storage	MIL-STD-810F, Method 502.4. -31 °C/(- 24 °F) Constant; 3 Days
20	Humidity	MIL-STD-810E, Method 507.3 Natural, Cycle 1, Quick Look.
20	Transportation / Vibration	MIL-STD-810F, Method 514.5. U.S Highways; 3 Axes; 12 Hrs/Axis
20	Drop	3 Foot Drop; 1 Drop per Axis
20	Filter Efficiency	42 CFR § 84: 170, 179 and 181





# Laboratory Respirator Protection Level Test (LRPL)

Quantity Required	Test	Test Method
30-65	Donning	To Be Determined
30-65	LRPL	Similar to STP-CBRN-0352

- Note:
1. Same Respirators will be used for all tests;
  2. Tests shall be performed as listed, top to bottom



# Questions

Mr. Frank Palya, NIOSH

- [fcpt2@cdc.gov](mailto:fcpt2@cdc.gov)
- 412 386-6637

<http://www.cdc.gov/niosh/npptl/default.html>

1-800-35-NIOSH

[npptl@cdc.gov](mailto:npptl@cdc.gov)

