



National Institute for Occupational Safety and Health
National Personal Protective Technology Laboratory
P.O. Box 18070
Pittsburgh, PA 15236

Procedure No. RCT-APR-STP-0043	Revision: 1.1	Date: 30 June 2005
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DETERMINATION OF HYDROGEN SULFIDE SERVICE LIFE TEST,
AIR-PURIFYING RESPIRATORS
STANDARD TESTING PROCEDURE (STP)

1. PURPOSE

This test establishes the procedure for ensuring that the level of protection provided by the hydrogen sulfide service life requirements on chemical cartridges and gas masks air-purifying respirators submitted for Approval, Extension of Approval, or examined during Certified Product Audits meet the minimum certification standards set forth in 42 CFR Part 84, Subpart G, Section 84.63(a)(c)(d), Subpart I, Section 84.110(c), Subpart L, Section 84.190(b), and Subpart KK, Section 84.1157; Volume 60, Number 110, June 8, 1995.

2. GENERAL

This STP describes the Determination of Hydrogen Sulfide Service Life Test, Air-Purifying Respirators test in sufficient detail that a person knowledgeable in the appropriate technical field can select equipment with the necessary resolution, conduct the test, and determine whether or not the product passes the test.

3. EQUIPMENT/MATERIAL

3.1. The list of necessary test equipment and materials follows:

- 3.1.1. Miller Nelson Research Model 401 Flow-Temperature-Humidity Control System or equivalent.
- 3.1.2. Interscan Corporation Model 1176 Hydrogen sulfide detector or equivalent.
- 3.1.3. Radiometer America Multi-Titration System, Model DTS 800, or equivalent.
- 3.1.4. "The Gilibrator", Primary Standard Airflow Calibrator or equivalent.
- 3.1.5. Brooks Rotameter, R 215-D for cartridges and R 215-B for canisters.
- 3.1.6. Gilian Gil-Air-3 Sampling Pump, or equivalent.
- 3.1.7. Fisher Scientific Gas washing bottle or bubbler, catalog # 03-036 or equivalent.
- 3.1.8. Erlenmeyer flasks, 250 to 500 milliliters (ml).

Approvals:	<u>1st</u> Level	<u>2nd</u> Level	<u>3rd</u> Level
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- 3.1.9. Separatory funnel with rubber stopper, 125 ml.
- 3.1.10. Aspirator bulb with tubing and stopper.
- 3.1.11. Joint clamp.
- 3.1.12. Pipets, 10-20 ml.
- 3.1.13. Iodine (I₂) (crystals) or 0.025N certified iodine solution.
- 3.1.14. Potassium Iodide (KI) (granular).
- 3.1.15. Sodium Thiosulfate (Na₂S₂O₃) (granular) or 0.025 Normal (N) certified Na₂S₂O₃ solution.
- 3.1.16. Sodium Hydroxide (NaOH) (granular).
- 3.1.17. Sodium Thiosulfate (Na₂S₂O₃) (granular).
- 3.1.18. Vaisala model HMI 31 humidity indicator.
- 3.1.19. Certified cylinder of 10 parts per million (ppm) H₂S in Nitrogen.
- 3.1.20. Hydrogen Sulfide cylinder, 99% purity.
- 3.1.21. Electronic balance with accuracy of 0.001 grams (g).
- 3.2. Test fixture for mounting cartridges and canisters. The test fixture used is specific to each manufacturer depending on how the cartridge, canister, or powered air-purifying respirator (PAPR), mouth bit, etc. is mounted to the facepiece. The T-end has a 29/42 ground glass joint glued in place. Canisters are tested with their connections glued into the ground glass joint. In most cases the cartridge cups of the respirator are affixed by hot melt glue to PVC pipe tee of appropriate size. PAPR cartridges and canisters are tested on their blower units if possible, or on suitable substitutions, if the unit is too large for the test chamber.
- 3.3. The test chamber consisting of a 12" x 11½" x 7" air tight box, made of ½" plexiglass with 2 hinge type locks on the door opening lined with gasket material. A ½" hole is located on the back of the test chamber for the introduction of the test concentration and a 1½" hole on the top for the exit of the test fixture and to detect the breakthrough concentration. This fixture is not commercially available.
- 3.4. Resistance tester consisting of a vacuum source capable of delivering 85 liters per minute (lpm), a 6-inch slant manometer, and a 29/42 female ground glass joint. The resistance testers currently being used are located on the silica dust chamber.

4. TESTING REQUIREMENTS AND CONDITIONS

- 4.1. Prior to beginning any testing, all measuring equipment to be used must have been calibrated in accordance with the manufacturer's calibration procedure and schedule. At a minimum, all measuring equipment utilized for this testing must have been calibrated within the preceding 12 months using a method traceable to the National Institute of Standards and Technology (NIST).
- 4.2. Normal laboratory safety practices must be observed. This includes safety precautions described in the current ALOSH Facility Laboratory Safety Manual.
 - 4.2.1. Safety glasses, lab coats, and hard-toe shoes must be worn at all times.
 - 4.2.2. Work benches must be maintained free of clutter and non-essential test equipment.
 - 4.2.3. When handling any glass laboratory equipment, lab technicians and personnel must wear special gloves which protect against lacerations or punctures.
- 4.3. **HYDROGEN SULFIDE BENCH TEST FOR CARTRIDGES**
 - 4.3.1. Resistance to air flow will be taken before and after each test (see 84.203).
 - 4.3.2. Three "as received" cartridges (or pairs of cartridges) will be tested at 64 lpm, continuous air flow, 50 ± 5 percent relative humidity (RH), approximately 25 degrees Celsius ($^{\circ}\text{C}$), and 1000 ppm H_2S .
 - 4.3.3. Two cartridges or pairs of cartridges will be equilibrated at room temperature by passing 25 percent RH air through them at 25 lpm for 6 hours and then testing them at 50 percent RH, approximately 25°C , and 32 lpm continuous air flow rate containing 1000 ppm H_2S .
 - 4.3.4. Two cartridges or pairs of cartridges will be equilibrated at room temperature by passing 85 percent RH air through them at 25 lpm for 6 hours and then testing them at 50 percent RH, approximately 25°C , and 32 lpm continuous air flow rate containing 1000 ppm H_2S .
- 4.4. **HYDROGEN SULFIDE BENCH TEST FOR CANISTERS**
 - 4.4.1. Three "as received" canisters will be tested at 64 lpm, continuous air flow, 50 ± 5 percent RH, approximately 25°C , containing 5000 ppm H_2S for chin style and escape gas mask canisters, or 20,000 ppm H_2S for front and back mounted canisters.
 - 4.4.2. Two canisters will be equilibrated at room temperature by passing 25 percent RH air through them at 64 lpm for 6 hours and then testing them at 50 percent RH, approximately 25°C , and 32 lpm continuous air flow rate containing 5000 ppm

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H₂S for chin style and escape gas mask canisters, or 20,000 ppm H₂S for front and back mounted canisters.

4.4.3. Two canisters will be equilibrated at room temperature by passing 85 percent RH air through them at 64 lpm for 6 hours and then testing them at 50 percent RH, approximately 25°C, and 32 lpm continuous air flow rate containing 5000 ppm H₂S for chin style and escape gas mask canisters, or 20,000 ppm H₂S for front and back mounted canisters.

4.5. HYDROGEN SULFIDE BENCH TESTS FOR PAPR CARTRIDGES/CANISTERS

4.5.1. Resistances and airflows for tight fitting PAPR will be taken before and after each test. Airflows only for loose fitting PAPR will be taken before and after each test.

4.5.2. Three cartridges (or pairs of cartridges) will be tested at 115 lpm for tight fitting PAPR or 170 lpm for loose fitting PAPR hood or helmet continuous air flow, approximately 25°C, and 50 ± 5 percent RH with 1000 ppm H₂S. Tight fitting only PAPR gas mask canisters will be tested at 115 lpm at 5000 ppm H₂S.

4.5.3. Two cartridges (or pairs of cartridges) will be equilibrated by passing 115 lpm for tight fitting PAPR or 170 lpm for loose fitting PAPR hood or helmet, continuous air flow through them at approximately 25°C, and 25 percent RH for six hours. They will then be tested at 115 or 170 lpm continuous air flow, approximately 25°C, 50 ± 5 percent RH, 1000 ppm H₂S. Tight fitting only PAPR gas mask canisters will be tested at 115 lpm at 5000 ppm H₂S.

4.5.4. Two cartridges (or pairs of cartridges) will be equilibrated by passing 115 lpm for tight fitting PAPR or 170 lpm for PAPR loose fitting hood or helmet, continuous air flow through them at 25°C, and 85 percent RH for six hours. They will then be tested at 115 or 170 lpm continuous air flow, 25°C, 50 ± 5 percent RH, 1000 ppm H₂S. Tight fitting only PAPR gas mask canisters will be tested at 115 lpm at 5000 ppm H₂S.

4.6 **Please refer to Material Safety Data Sheets and the NIOSH Health and Safety Manual for the proper protection and care in handling, storing, and disposing of the chemicals and gases used in this procedure.**

4.7 **THE LOWER EXPLOSIVE LIMIT OF H₂S IS 40,000 PPM.**

5. PROCEDURE

Note: Reference Section 3 for equipment, model numbers and manufacturers. For calibration purposes use those described in the manufacturer's operation and maintenance manuals.

5.1. Follow individual instruction manuals for set up and maintenance of equipment used in this procedure prior to beginning testing. Malfunctioning equipment must be repaired or replaced and properly set up and calibrated before starting all tests.

- 5.2. After the manufacturer's specified warmup period, calibrate the H₂S analyzer using the certified gas cylinder containing the 10 ppm standard as follows:
 - 5.2.1 With a tee in line on the gas cylinder, insert the intake tubing from the analyzer into the tee.
 - 5.2.2 Turn on the 10.0 ppm certified hydrogen sulfide cylinder.
 - 5.2.3 Wait till the reading stabilizes, and adjust the span control to read 10 ppm.
- 5.3. Prepare solutions as follows: (Note: commercially purchased certified solutions can be substituted.)
 - 5.3.1. 1.0 N Sulfuric acid: To a 1 liter volumetric flask containing 500 ml distilled water, add 28 ml concentrated sulfuric acid (H₂SO₄), then dilute to the 1 liter mark with distilled water.
 - 5.3.2. 1.0 N Sodium hydroxide: Dissolve 40g sodium hydroxide (NaOH) in 1 liter distilled water.
 - 5.3.3. 0.25N Iodine solution:
 - 5.3.3.1. Dissolve 50g KI in 44.5 ml distilled water.
 - 5.3.3.2. Weigh 6.346g I₂ crystals on a watch glass.
 - 5.3.3.3. Hold the watch glass over a 500 ml beaker.
 - 5.3.3.4. Wash the glass with half of the KI solution.
 - 5.3.3.5. Stir to dissolve crystals.
 - 5.3.3.6. Transfer to a 2 liter flask.
 - 5.3.3.7. Wash beaker with remaining KI solution and add distilled water to mark.
- 5.4. Set up test equipment as shown in Figure 1. In addition to the humidity reading controlled by the Miller Nelson system, the Vaisala HMI 31 humidity indicator sensor is inserted into the air stream via a tee set-up directly prior to the introduction of the gas. This set up is not shown on Figure 1. The humidity reading obtained at this point takes into account tubing length and outside hood air temperature.
- 5.5. Turn on:
 - 5.5.1. Miller Nelson Unit.
 - 5.5.2. Air and water supplies.

- 5.5.3. H₂S cylinder.
- 5.7. Establish the test concentration for 1000 ppm H₂S.
- 5.8. Measure 50 ml 1.0N NaOH (100 ml for 5,000 and 20,000 ppm) into the gas bubbler. Attach Gil-Air 3 sampling pump to intake side of the gas bubbler. Connect outlet side of bubbler to Gilibrator. Check 1 lpm flow of the pump pulling through the sodium hydroxide solution. This setting will be used to sample the hydrogen sulfide concentration.
- 5.9. Adjust the rotameter to the appropriate setting necessary to obtain the desired concentration of 1000 ppm H₂S. For testing at higher airflows or concentrations, a rotameter delivering a higher flow rate will need to be used.
- 5.10. Connect tubing from the sample side of gas bubbler into the Gil-Air pump and tubing from the inlet side of the gas bubbler into the test gas concentration.
- 5.11. Turn Gil-Air pump on and sample at 1 lpm for 1 minute.
- 5.12. Remove the gas bubbler, and transfer the solution into an Erlenmeyer flask.
- 5.13. Rinse the gas bubbler with distilled water and transfer the washings into the flask.
- 5.14. Attach the separatory funnel with a rubber stopper to the flask and clamp in place. There must be an air-tight seal between the funnel and flask to prevent the H₂S from escaping.
- 5.15. Measure 54 ml H₂SO₄ into the separatory funnel.
- 5.16. Insert the rubber stopper of the aspirator into the top of the separatory funnel.
- 5.17. Open the stopcock of the separatory funnel and aspirate the H₂SO₄ into the flask.
- 5.18. Keeping the separatory funnel still in the flask, close the funnel stopcock and remove the aspirator stopper.
- 5.19. Measure a known volume of 0.025N standard iodine solution (see 5.19.1) into the separatory funnel. The measured amount of iodine added should be in excess of the amount needed.
- 5.19.1. The hydrogen sulfide cannot be collected directly in iodine because the rate of reaction is too slow to capture it all without loss. The hydrogen sulfide is collected in sodium hydroxide, and released by sulfuric acid at a controlled rate. The sulfuric acid releases hydrogen sulfide when it reacts with the hydrogen sulfide-sodium hydroxide solution in the flask. The hydrogen sulfide thus released is immediately caught in a known excess of iodine. The excess iodine is back titrated with sodium thiosulfate.

5.19.2. For example:

$$\text{Volume I}_2 = \frac{\text{concentration}}{\text{standard factor 305.6 ppm/ml I}_2}$$

$$\text{Volume I}_2 = \frac{1,000 \text{ ppm}}{305.6 \text{ ppm/ml I}_2}$$

$$\text{Volume I}_2 = 3.27 \text{ ml I}_2$$

5.19.3. Iodine in an amount greater than 3.27 ml should be added.

- 5.20. Record the amount of iodine added.
- 5.21. Insert the rubber stopper of the aspirator into the top of the separatory funnel.
- 5.22. Open the stopcock of the separatory funnel and aspirate the iodine into the flask.
- 5.23. The solution will turn yellow.
- 5.24. Remove the funnel and stopper.
- 5.25. Back titrate the excess iodine of the sample concentration with 0.025N sodium thiosulfate dropwise till colorless.
- 5.26. Obtain the net iodine titration.

$$\text{net I}_2 \text{ titration} = \text{volume I}_2 \text{ added} - \text{volume Na}_2\text{S}_2\text{O}_3 \text{ used}$$

$$\text{net I}_2 \text{ titration} = 10.0 \text{ ml} - 6.7 \text{ ml}$$

$$\text{net I}_2 \text{ titration} = 3.3 \text{ ml I}_2$$

- 5.27. Calculate the concentration of hydrogen sulfide.

Concentration (ppm) = net I₂ titration x standard factor

Concentration = 3.3 ml I₂ x 305.6 ppm/ml I₂

Concentration = 1008 ppm H₂S

- 5.28. Once the test concentration has been established, testing may begin.
- 5.29. Weigh the cartridge or canister and record the weight.
- 5.30. Take inhalation and exhalation resistances of the cartridge or canister mounted on the facepiece at 85 lpm. See Sections 84.122, 84.203, 84.1157, Title 42, Code of Federal Regulations, Part 84 for breathing resistance requirements. Take airflows of PAPR cartridge or canister mounted on blower assembly.
- 5.31. Mount cartridge or canister onto test fixture and place in testing chamber.
- 5.32. Direct challenge concentration airflow into test chamber. Start timer. Mount small piece of tygon tubing onto the outlet of the test fixture. Insert intake tubing of detector into a slit cut into the side wall of the tubing to allow the detector to sample at the flow rate of the detector without interference from airflow back pressure. Monitor and record upstream and downstream temperatures throughout testing. Record breakthrough values and times.
- 5.33. Run test until breakthrough of 10.0 ppm is observed or minimum service life is surpassed depending on type of cartridge or canister tested.
- 5.34. Dismount cartridge or canister, weigh and record final weight, and take final inhalation and exhalation resistances and PAPR airflows.
- 5.35. Shut off hydrogen sulfide cylinder.
- 5.36. Disconnect hydrogen sulfide tubing from the rotameter to prevent contamination the humidity sensor.
- 5.37. Allow clean air to purge through system for 10 - 15 minutes.
- 5.38. Turn off air and water supply to Miller Nelson system.

6. PASS/FAIL CRITERIA

- 6.1. The criterion for passing this test is set forth in 42 CFR Part 84, Subpart G, Section 84.63(a)(c)(d), Subpart I, Section 84.110(c), Subpart L, Section 84.190(b), and Subpart KK, Section 84.1157; Volume 60, Number 110, June 8, 1995.
- 6.2. This test establishes the standard procedure for ensuring that:

84.63 Test requirements; general.

(a) Each respirator and respirator component shall when tested by the applicant and by the Institute, meet the applicable requirements set forth in subparts H through L of this part.

(c) In addition to the minimum requirements set forth in subparts H through L of this part, the Institute reserves the right to require, as a further condition of approval, any additional requirements deemed necessary to establish the quality, effectiveness, and safety of any respirator used as protection against hazardous atmospheres.

(d) Where it is determined after receipt of an application that additional requirements will be required for approval, the Institute will notify the applicant in writing of these additional requirements, and necessary examinations, inspections, or tests, stating generally the reasons for such requirements, examinations, inspections, or tests.

84.110 Gas masks; description.

(c) Gas masks for respiratory protection against gases and vapors other than those specified in paragraph (b) of this section, may be approved upon submittal of an application in writing for approval to the Respirator Branch listing the gas or vapor and suggested maximum use concentration for the specific type of gas mask. The Institute will consider the application and accept or reject it on the basis of effect on the wearer's health and safety and any field experience in use of gas masks for such exposures. If the application is accepted, the Institute will test such masks in accordance with the requirements of this subpart.

84.190 Chemical cartridge respirators: description.

(b) Chemical cartridge respirators for respiratory protection against gases or vapors, which are not specifically listed with their maximum use concentration, may be approved if the applicant submits a request for such approval, in writing, to the Institute. The Institute shall consider each such application and accept or reject the application after a review of the effects on the wearer's health and safety and in the light of any field experience in use of chemical cartridge respirators as protection against such hazards.

84.1157 Chemical cartridge respirators with particulate filters; performance requirements; general. Chemical cartridge respirators with particulate filters and the individual components of each such device shall, as appropriate, meet the following minimum requirements for performance and protection:

(a) Breathing resistance test.

(1) Resistance to airflow will be measured in the facepiece, mouthpiece, hood, or helmet of a chemical cartridge respirator mounted on a test fixture with air flowing at a continuous rate of 85 liters per minute, both before and after each test conducted in accordance with paragraphs (d) through (f) of this section

(2) The maximum allowable resistance requirements for chemical cartridge respirators are as follows:

Maximum Resistance
[mm. water-column height]

Type of chemical cartridge respirator	Inhalation		Exhalation
		Final ¹	
For gases, vapors, or gases and vapors, and dusts, fumes, and mists	50	70	20
For gases, vapors, or gases and vapors, and mists of paints, lacquers, and enamels	50	70	20

¹Measured at end of service life specified in Table 11 in subpart L of this part.

(b) Facepiece test. The facepiece test will be conducted as specified in 84.205.

(c) Lacquer and enamel mist tests; general.

(1) Three respirators with cartridges containing or having attached to them, filters for protection against mists of paints, lacquers, and enamels shall be tested in accordance with the provisions of paragraph (f) of this section.

(2) In addition to the test requirements set forth in paragraph (c)(1) of this section, three such respirators will be tested against each aerosol in accordance with the provisions of paragraphs (d) and (e) of this section.

(d) Lacquer mist test.

(1) Temperature in the test chamber will be approximately 25° C.

(2) Continuous airflow through the respirator will be 32 liters per minute for air-purifying respirators, and not less than 115 liters per minute to tight fitting facepieces and 170 liters per minute to loose-fitting hoods and helmets of powered air-purifying respirators.

(3) Airflow through the chamber will be 20-25 air changes per minute.

(4) The atomizer employed will be a No. 64-5 nozzle with setup 3, or equivalent, operating at 69 kN/m.² (10 pounds per square inch gauge).

(5) The test aerosol will be prepared by atomizing a mixture of one volume of clear cellulose nitrate lacquer and one volume of lacquer thinner. The lacquer described in Federal Specification TT-L-31, October 7, 1953, is an example of an acceptable lacquer. Copies of TT-L-31 may be inspected or obtained from the NIOSH, Respirator Branch, 1095 Willowdale Road, Morgantown, W.V. 26505-2888.

(6) The concentration of cellulose nitrate in the test aerosol will be 95-125 milligrams per cubic meter.

(7) The test aerosol will be drawn to each respirator for a total of 156 minutes for air-purifying respirators and 240 minutes for powered air-purifying respirators.

(8) The total amount of unretained mist in the samples taken during testing, weighed as cellulose nitrate, shall not exceed 5 milligrams for an air-purifying respirator, 28 milligrams for a powered air-purifying respirator with tight-fitting facepiece, and 41 milligrams for a powered air-purifying respirator with loose-fitting hood or helmet.

(e) Enamel mist test.

(1) Temperature in the test chamber will be approximately 25° C.

(2) Continuous airflow through the respirator will be 32 liters per minute for air-purifying respirators, and not less than 115 liters per minute to tight-fitting facepieces and 170 liters per minute to loose-fitting hoods and helmets of powered air-purifying respirators.

(3) Airflow through the chamber will be 20-25 air changes per minute.

(4) The atomizer employed will be a No. 64 nozzle with setup 1A, or equivalent, operating at 69 kN/m.² (10 pounds per square inch gauge).

(5) The test aerosol will be prepared by atomizing a mixture of 1 volume of white enamel and 1 volume of turpentine. The enamel described in Federal Specification TT-E-489b, May 12, 1953, with amendment-1 of 9 November 1955 is an example of an acceptable enamel. Copies of TT-E-489b may be inspected or obtained from the NIOSH, Respirator, 1095 Willowdale Road, Morgantown, W.V. 26505-2888.

(6) The concentration of pigment in the test aerosol, weighed as ash, will be 95-125 milligrams per cubic meter.

(7) The test aerosol will be drawn to each respirator for a total of 156 minutes for air-purifying respirators and 240 minutes for power air-purifying respirators.

(8) The total amount of unretained mist in the samples taken during testing, weighed as ash, shall not exceed 1.5 milligrams for any air-purifying respirator, 8.3 milligrams for a powered air-purifying respirator with tight-fitting facepiece, and 12.3 milligrams for a powered air-purifying respirator with loose-fitting hood or helmet

(f) Bench tests; gas and vapor tests.

(1) Bench tests will be made in accordance with 84.207 and tested cartridges shall meet the minimum requirements set forth in Table 11 of Subpart L of this part. Cartridges will be equilibrated in accordance with paragraph (f)(2) of this section.

(2)(i) Two powered air-purifying cartridges or pairs of cartridges will be equilibrated at room temperature by passing 25 percent relative humidity air through them at the following flow rates (expressed in liters per minute (l.p.m.)) for 6 hours:

<u>Type of cartridge</u>	<u>Airflow rate, l.p.m.</u>
Powered air purifying with tight-fitting facepiece	115
Powered air purifying with loose-fitting hood or helmet	170

(ii) Two powered air-purifying cartridges or pairs of cartridges will be equilibrated by passing 85 percent relative humidity air through them at the flow rates stated in paragraph (f)(2)(i) of this section.

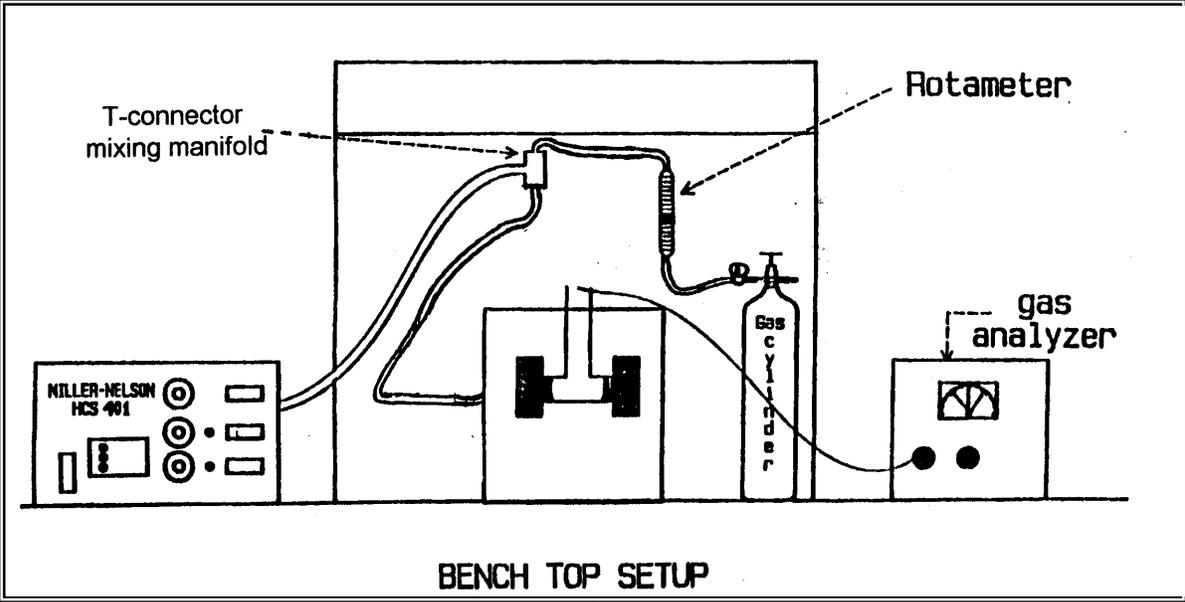
(iii) All cartridges will be resealed, kept in an upright position, at room temperatures, and tested within 18 hours.

7. RECORDS/TEST SHEETS

- 7.1. All test data will be recorded on the HYDROGEN SULFIDE SERVICE LIFE test data sheet.
- 7.2. All videotapes and photographs of the actual test being performed, or of the tested equipment shall be maintained in the task file as part of the permanent record.
- 7.3. All equipment failing any portion of this test will be handled as follows:
 - 7.3.1. If the failure occurs on a new certification application, or extension of approval application, send a test report to the RCT Leader and prepare the hardware for return to the manufacturer.
 - 7.3.2. If the failure occurs on hardware examined under an Off-the-Shelf Audit the hardware will be examined by a technician and the RCT Leader for cause. All equipment failing any portion of this test may be sent to the manufacturer for examination and then returned to NIOSH. However, the hardware tested shall be held at the testing laboratory until authorized for release by the RCT Leader, or his designee, following the standard operating procedures outlined in Procedure for Scheduling, and Processing Post-Certification Product Audits, RB-SOP-0005-00.

8. ATTACHMENTS

- 8.1 Bench Top Set-Up.
- 8.2 Data Sheet.





NIOSH National Institute for Occupational Safety and Health

RB - RESPIRATOR CERTIFICATION TEAM

GAS & VAPOR RESPIRATOR TEST DATA SHEET (Ref.33-48,50,62) STP No.: [_____]

Task Number: TN- _____ Gas Name: _____

Manufacturer: _____ Item Tested: _____

RESISTANCE	Maximum Allowable Resistance (mm of H ₂ O)				Actual Resistance (mm of H ₂ O)				Result
	Inhalation		Exhalation		Inhalation		Exhalation		
			Initial		Initial	Final	Initial	Final	
1									
2									
3									
4									
5									
6									
7									
Overall Results: Pass _____ Fail _____ Comment: _____									

WEIGHTS AND AIRFLOWS	WEIGHTS (gm)				AIRFLOW (lpm)				Result
	Con'd			Conc.	Test Rate		(PAPR Only)		
					RH%	lpm	Initial	Final	
Test				(ppm)					
1									
2									
3									
4									
5									
6									
7									
Overall Results: Pass _____ Fail _____ Comment: _____									

DATA TABLE Test	Test Cond.	Final Time (min)	Leakage (ppm)	Temperature (°C)		Corrected Time (min)
				Dns tream	Upstr eam	
1						
2						
3						
4						
5						
6						
7						

Overall Results: Pass _____ Fail _____ Comment:

Was all testing equipment in calibration throughout all testing: Yes _____ No _____

Signature: _____ Date: _____

	RB - RESPIRATOR CERTIFICATION TEAM GAS & VAPOR RESPIRATOR TEST DATA SHEET (Ref.33-48,50,62)	Page 2 STP No.: [_____]
Task Number: TN- _____ Gas Name: _____ Manufacturer: _____ Item Tested: _____		
Additional Comments: _____ <div style="text-align: right;"> Signature: _____ Date: _____ </div>		

Revision History

Revision	Date	Reason for Revision
1.0	14 March 2002	Historic document
1.1	30 June 2005	Update header and format to reflect lab move from Morgantown, WV No changes to method