



National Institute for Occupational Safety and Health  
National Personal Protective Technology Laboratory  
626 Cochrans Mill Road  
Pittsburgh, PA 15236

Procedure No. RCT-ASR-STP-0114

Revision: 1.2

Date: 21 October 2020

DETERMINATION OF SOUND LEVEL MEASUREMENT, ESCAPE, OPEN-CIRCUIT,  
SELF-CONTAINED BREATHING APPARATUS USING HOODS OR HELMETS  
STANDARD TESTING PROCEDURE (STP)

1. PURPOSE

This document establishes the procedures for ensuring that operational air velocity and noise level requirements for hoods or helmets used on Self-Contained Breathing Apparatus (SCBA) 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(c).

2. GENERAL

This STP describes the Determination of Sound Level Measurements, Open-Circuit, Self-Contained Breathing Apparatus Using Hoods or Helmets 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/MATERIALS

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

3.1.1. Quest Technologies Noise Pro Series Dosimeter or equivalent. For OSHA use, the dosimeter must have a 5 dB exchange rate, use a 90 dBA criterion level, be set at slow response, and use either an 80 dBA or 90 dBA threshold gate, or a dosimeter that has both capabilities, whichever is appropriate for the evaluation.

3.1.2. Life size mannequin.

3.1.3. Self Contained Breathing Apparatus using a hood or helmet.

4. TESTING REQUIREMENTS AND CONDITIONS

4.1. Prior to beginning any testing, confirm that all measuring equipment employed has been calibrated in accordance with the testing laboratory's calibration procedure and schedule. All measuring equipment utilized for this testing must have been calibrated using a method traceable to recognized international standards when available.

4.2. A background noise level of no greater than 60 dB shall be established and maintained in the location where the procedure is performed.

- 4.3 This test should be done on a minimum of two respirators, or more if additional testing is required (42 CFR, Part 84, Sections 84.12, 84.30, and 84.60).

## 5. PROCEDURE

- 5.1 Turn on the Quest Technologies Noise Pro Series Dosimeter.
- 5.2 Attach the Quest Technologies Noise Pro Series Dosimeter microphones on each ear of the mannequin.
- 5.3 Mount the hood or helmet of the respirator under test on the mannequin according to the manufacturer's instructions.
- 5.4 Each sample measurement should be averaged over 30 seconds. Once the dBA noise level of the mannequin setup has been determined to be below the 85 dBA safety limit, test subject testing may begin.
- 5.5 Start SCBA at highest flow recorded during air flow test.
- 5.6 Three sound level measurements are taken at each ear and averaged. The results for the two ears are then averaged.
- 5.7 Record all measurements on test data sheet.

## 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 (c).
- 6.2 This test establishes the standard procedure for ensuring that:

*84.63 Test requirements; general.*

*(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.*

- 6.3 The maximum sound level for SCBA hoods or helmets shall not exceed 115 dBA.

## 7. RECORDS\TEST SHEETS

- 7.1 Record test data in a format that shall be stored and retrievable. Data is to be reported as shown in the attached example data sheet.

8. ATTACHMENTS

- 8.1. Special Test – Sound Level Measurement, Open-Circuit, Self-Contained Breathing Apparatus Using Hoods or Helmets Test Data Sheet

8.1. Special Test – Sound Level Measurement, Open-Circuit, Self-Contained Breathing Apparatus Using Hoods or Helmets Test Data Sheet

**SPECIAL TEST - SOUND LEVEL MEASUREMENT, OPEN-CIRCUIT, SELF-CONTAINED BREATHING APPARATUS USING HOODS OR HELMETS**

Project No : \_\_\_\_\_ Date: \_\_\_\_\_

Company : \_\_\_\_\_

Respirator Type: \_\_\_\_\_

Reference: 42 CFR, Part 84, Subpart G, Section 84.63(c)

Requirement: The maximum sound level inside of an SCBA hood or helmet shall not exceed 115 dBA.

Procedure: The respirator is mounted on a manikin. Three sound level measurements are taken at each ear and averaged. The results for the two ears are then averaged.

Results:

Sound Level	Unit #1		Unit #2	
	Left ear	Right ear	Left ear	Right ear
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
AVERAGE:	_____	_____	_____	_____

Comments:

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Test Engineer: \_\_\_\_\_ Pass \_\_\_\_\_ Fail \_\_\_\_\_

### Revision History

<b>Revision</b>	<b>Date</b>	<b>Reason for Revision</b>
1.0	1 June 2000	Historic document
1.1	20 September 2005	Update header and format to reflect lab move from Morgantown, WV. No changes to method
1.2	21 October 2020	The document is updated to current style and content standards. There is no change to the test set up or method, but specified sound measurement instrumentation has been updated. The ability to collect an average measurement expressed in dBA over the specified 30 second interval eliminates the need to convert dose to dBA.